

Sustainable Development Strategy and Product Responsibility

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Abstract:

The European Union has formulated a long-term strategy to dovetail the policies for economically, socially and environmentally sustainable development. Taking on challenges and seeking innovative solutions is a way to assure the future. Therefore the organization has a vital interest in protecting the environment and natural resources. The article focuses on product responsibility as a part of sustainable development. Integrated products responsibility integrates the requirements of sustainable development and environmental management. Product responsibility begins with development of products that are environmental friendly with continual improvement cycle and with processes innovations, even after their use, create the smallest possible environmental load.

Key words: innovation, environment, management, product responsibility, sustainable development

1 Introduction

In most cases, manufacturers have the greatest ability, and therefore the greatest responsibility, to reduce the environmental impacts of their products. Companies that are accepting the challenge are recognizing that product stewardship also represents a substantial business opportunity. By rethinking their products, their relationships with the supply chain, and the ultimate customer, some manufacturers are dramatically increasing their productivity, reducing costs, fostering product and market innovation, and providing customers with more value at less environmental impact. Reducing use of toxic substances, designing for reuse and recyclability, and creating take back programs are just a few of the many opportunities for companies to become better environmental stewards of their products. In the 21st century, forward-thinking businesses have recognized that demonstrated corporate citizenship and maximum resource productivity are essential components to

creating competitive advantage and increasing shareholder wealth. All products are designed with a consumer in mind. Ultimately, it is the consumer who makes the choice between competing products and who must use and dispose of products responsibly. Without consumer engagement in product stewardship, there is no closing of the loop. Consumers must make responsible buying choices which consider environmental impacts. They must use products safely and efficiently. Finally, they must take the extra steps to recycle products that they no longer need. [1]. That means to detect trends at an early stage and put forward appropriate solutions. Integrated production processes innovation model which promotes production processes innovation was derived from the model of managing company policy following the interest theory and business excellence. The successful development and implementation of processes innovation in an organizational system can produce a significant saving in the amount of business and environment resources and therefore a smaller environmental impact [7]. The heightened awareness

of the importance of environmental protection, and the possible impacts associated with products manufactured and consumed, has increased the interest in the development of methods to better comprehend and reduce these impacts [3]. All the activities of the BMW Group are designed to increase the value of the company continuously and over the long term. In the view of the Group, long-term growth is generated by thinking long-term and acting in a sustainable manner. The central factors for success are concentrating on the premium segment, the skill and dedication of their employees, the maximum focus on what the customer wants, plus an ability to innovate, which is firmly rooted in the corporate culture [2].

2 Problem Formulation

2.1 Renewed EU Sustainable Development Strategy

The EU's Sustainable Development Strategy aims, in tandem with the Lisbon Strategy for growth and jobs, for a more prosperous, cleaner and fairer Europe. Sustainable Development is an overarching concept. The EU Treaty requires the integration of sustainable development into all European policies, so that they contribute in an integrated way to meeting economic, environmental and social objectives [4].

The Renewed EU Sustainable Development Strategy identifies seven key challenges:

- (i) climate change and clean energy,
- (ii) sustainable transport,
- (iii) sustainable consumption and production,
- (iv) conservation and management of natural resources,
- (v) public health,
- (vi) social inclusion, demography and migration, and
- (vii) (vii) global poverty and sustainable development challenges.

The EU SDS constitutes a general framework within which the Lisbon Strategy embodies a driving force of a more dynamic economy by stressing the importance of growth and job creation. Both strategies take account of mutual complementarities that exist between the economic, social and environmental objectives that need to be jointly developed. Both strategies further strive to foster the necessary structural changes in which the Member States' economies gain strength to face the globalisation challenges by creating equal conditions which stimulate the thriving of dynamics, innovation and

creative entrepreneurship and simultaneously ensuring social justice and healthy environment. The EU SDS pays full attention to the management cyclus, whereby a crucial novelty lies in the more effective management sustained by regular biennial progress reports. The first report that will build on the Member States' input, will be issued in the second half of 2007 by the European Commission [5].

Figure 1 presents The Flower. The Flower is the symbol of the European Eco-label – your guide to greener products and services. It is a voluntary scheme designed to encourage businesses to market products and services that are kinder to the environment and for European consumers - including public and private purchasers - to easily identify them. You can find the Flower throughout the European Union as well as in Norway, Liechtenstein and Iceland. The European Eco-label is part of a broader strategy aimed at promoting sustainable consumption and production [4].



Figure 1: The Flower – symbol of the European Eco-label – your guide to greener products and services

2.2 Product responsibility

Based on the programming documents for implementing the EU cohesion policy in the period 2007-2013, Slovenia will conduct public tenders for promoting entrepreneurship in a manner that in assessing the projects account will also be taken of the investments' environmental impacts. Support will only be granted to those investments in new technological equipment and machinery which, compared to obsolete technologies, are considerably environment friendlier [5]. Industrial production accounts for a significant share in the overall pollution, in particular through

greenhouse gases, substances causing acidification, waste waters and waste materials. At the level of the EU, the rules for authorising and supervising industrial activities were standardised in the form of what is termed the IPPC Directive. In compliance with the said Directive, all companies engaged in activities which might cause major pollution (there are approximately 50,000 such companies in the EU and 200 in Slovenia) must obtain an integrated environmental permit, evidencing that the company concerned operates in compliance with the best available techniques and that the public was involved in the authorising procedure. The Member States are obliged to ensure, by 30 October 2007, that their companies do not operate without such a permit [5]. The modern concept of working out environmental protection policies is based upon the notion of sustainable development. In the environmental sphere, sustainable development is understood as an interdependent relationship between the economy, infrastructure, settlement and the way of living, taking into consideration the bearing capacity of the environment and natural resources [9].

In Slovenia, the preparations for meeting the conditions for the operations of such companies have been underway since 2000[10]. During that period, many companies have modernised their technologies, thereby reducing pollution, and many companies still have to take that step. The best available techniques do not only imply technical possibilities for limiting emissions, but also sustainable use of raw materials and energy [5]. Packaging has an important role. In most parts of the developed world, packaging constitutes as much as one-third of the non-industrial solid waste stream. As the developing world races to raise living standards, more countries are seeing significant growth in their packaging waste. At least 28 countries currently have laws designed to encourage reduced packaging and greater recycling of packaging discards. Many of these countries require manufacturers to take back packaging discards or pay for their recycling. There are no federal packaging mandates of a similar nature in the United States. However, state and local government concern about packaging waste continues to grow, while new containers emerge that complicate recycling. More recently, government reductions in recycling subsidies and a growing demand for secondary materials from abroad have placed increased pressures on domestic recyclers, especially plastics recyclers, who are competing fiercely for limited feedstock. New ways to increase the recovery of secondary materials, including packaging and plastics in particular, are clearly needed. Packaging can be made more sustainable by

applying the principles of product stewardship. This means:

- Eliminating toxic constituents
- Using less material
- Making packaging more reusable
- Using more recycled content
- Making it more readily recyclable [1].

There needs to be a change in the Waste Management approach philosophy – from managing to economizing waste [6]. This approach means a change in the philosophy of the management of a company, which proves that environmental policy is a part of business policy. So the elements of Environmental Management are included in all elements of business processes, activities and products of this company as in planning, producing and the life cycle of individual products. For this purpose there are various tools and regulations in the organisational and technical-technological field and in the field of controlling human resources and the treatment in line with employee's abilities. The consequences of this (tools and regulations) are economy effects which develop into Sustainable Development effects [8]. Especially in the case of environmental protection and Environmental .

2.3 Research, development and innovation

Research, development and innovation are one of the fundamental prerequisites for success in competitive market. The BMW Group is the most successful premium manufacturer in the automotive industry. One of the fundamental prerequisites for this success was and is ongoing leadership and innovation in the construction of cars perceived and acknowledged as leaders by the customer. Innovation upgrades the product in its substance, and only attractive product substance can secure the long-term success of a company in sales [2]. A further point is that innovation is the right tool to clearly stand out from the competition in an increasingly competitive premium market. Modern premium cars today have reached a comparably high level of technology in many respects, the customer taking features such as passive safety and quality for granted right from the start. Innovations in technology give the car maker the opportunity to stand out clearly from the competition and to express the features so typical of a BMW, MINI, or Rolls-Royce in and through the very substance of the product. A further point is that innovative technologies enable the manufacturer to minimise or completely overcome conflicts in interest in the development of a car. But innovation, as seen by the BMW Group, does not mean developing new concepts and technologies

simply because they happen to be new. Instead, new technologies must fulfil specific requirements in order to be acknowledged as genuine innovations [2]. The BMW Group supports the Kyoto targets and has been working intensively for years to reduce its fleet's fuel consumption. The energy strategy pursued by the BMW Group is sub-divided into three steps. In the short and medium term, the fuel consumption of vehicles will be reduced by new, highly efficient engine generations, active aerodynamics, the use of innovative lightweight materials and intelligent energy management within the vehicle. For the BMW Group, all of these activities fall under the concept of BMW EfficientDynamics [2]. Figure 2 presents The BMW Group long-term energy strategy – innovation for lower fuel consumption.



Figure 2: The BMW Group long-term energy strategy – innovation for lower fuel consumption [2].

Because of innovation and sustainable development meaning for Slovenian future, the Ministry of Education and Sport supports and co-finances two research projects under the theme of the inclusion of the elements of sustainable development. Within the framework of Target research projects for 2006, the Ministry of Education and Sport co-finances two research projects under the theme of the inclusion of the elements of sustainable development in the school curriculum (Analysis and promotion of integration of education for sustainable development in primary schools; Integration of elements of consumption and sustainable development in school curricula) [5].

The Ministry of Higher Education, Science and Technology promotes research into sustainable development by applying the respective guidelines to its tenders for basic and applied programmes and projects as well as for target research projects (TRP). The following basic research projects are thus currently co-financed: Sustainable development of

urban ecosystems, Sustainable MINLP optimisation of the life cycle of chemical processes; applied research projects Rational use of wood in the context of sustainable forest management, settlements and towns, Sustainable optimisation of the production process for special chemicals; post-doctoral research project Monitoring sustainable competitiveness and development of monitoring in the fields of individual policies; as well as the TRPs Genetic improvement of qualitative and quantitative features of economically-significant agricultural plants for competitive and sustainable production in Slovenia, Intensification of wood production and use as the basis for developing sustainable forest management in Slovenia, Classification and valuation of forest structure adequacy for planning sustainable multifunctional and close-to-nature management, Processing and sustainable use of agricultural physical space in Slovenia, Integration of criteria and measures for achieving sustainable spatial development of towns and other settlements in the broader urban area, Sustainable development of protected areas – integrated approach and the active role of the state; sustainable management in protected areas from the point of view of achieving a well-balanced regional development, Sustainable regulation of transport at the local level, Inclusion of the Koper Port in the framework of sustainable development of the littoral region [5]. Figure 3 presents Koper Port.



Figure 3: Koper Port [11]

3 Problem Solution

3.1 Recycling as Part of Sustainability

Recently, corporations have been confronted with a number of global environmental challenges such as global warming, acid rain, depletion of natural resources, waste management, green consumerism and pollution prevention. There is growing pressure to deliver products and services which are environmentally compatible. A number of corporations such as Du Pont, 3M, AT&T, Xerox and Procter & Gamble are, therefore, integrating various environmental policies and programmes into their operations strategy and specific decisions concerning operations such as product design/planning, process technology selection, and quality management. Introduces the concepts of environmental management (EM) and argues that firms which do not recognize the implications of environmental problems on the operations function will not succeed in the competitive market. [12]. One part is recycling as a part of sustainability. products. Recycling generally prevents the waste of potentially useful materials, reduces the consumption of raw materials and reduces energy usage, and hence greenhouse gas emissions, compared to virgin production [13]. Recycling is one aspect of product responsibility. Figure 4 presents the international recycling symbol.



Figure 4: The International Recycling Symbol

Recycling is the third R of the three R's: Reduce, Reuse, Recycle. Recycling means taking a product or material at the end of its useful life and turning it into a usable raw material to make another product [14]. Since early 2003, the BMW Group's national and international purchasing guidelines have contained provisions on environmental and social responsibility. Suppliers must agree to use energy and raw materials efficiently, minimize exhaust, noise and emissions, and set up and maintain an efficient environmental

management system. In addition, the BMW Group integrates environmental and recycling requirements into the product creation process from the very beginning, using the tools "Design for Recycling" and "Life Cycle Assessment". The technologies for recycling used cars are being refined all the time, as new technologies are being developed. In the early 90s, long before statutory regulations, the BMW Group had already started to establish a widespread network of recovery centres in the EU for the acceptance and recycling of vehicles. As a result, customers have been able to return BMW Group vehicles free of charge since 1 January 2007. Every end-of-life vehicle that BMW Group customers return to this network is recycled by a recognised disassembly business. Outside Europe, the applicable statutory provisions are still very different from country to country. But it is foreseeable that in many markets, statutes regarding old vehicles will be introduced [2].

3.3 Organizational approach

Survey of literature shows that there has been no research about innovation in production processes in manufacturing enterprises in transitional economies. Everybody speaks of technological development only, although it is causing increasing unemployment around the world and other problems such as motivation and environmental degradation, including a dangerous climate change. There is also an unchallenged supposition that in transitional economies owners and managers are equally fond of continuous innovation as are the ones in the most advanced corporations of the world [17].

The term "innovation" is usually associated only with technology, in the strictest meaning of the word (new)products and new methods for making them. Nevertheless, innovation refers to the process of bringing any new, problem solving idea into use. Idea (as a step on their way to innovation) for reorganizing, cutting costs, putting in new budgeting systems, improving communication, or assembling products in teams are all innovations, provided the new idea is useful in its users' judgement. Therefore, innovations in management methods and organizational practices constitute a wide range of opportunities for "corporate entrepreneurs" (Moss Kanter 1983: 20-21) as well as for other types of activating employees' ability and motivation (eg. 20 keys method, environmental standards ISO 14001, social accountability standards-SA 8000, safety and health standards OHSAS 18001, TQM-total quality (as well as self-regulation and business excellence) management and other innovation management methods) [17].

In efforts for the improvement of position on the purchaser's market the companies must also consider accordance of operation with valid environment protected prescriptions in field of process consumer. The inclusion of enterprises in the international market, the care for reputation, that the enterprise profit with the environment protection and permanent development, places the politics of environment protection to the base of the professional politics [18]. The environment protection and permanent development is so a basic component of the basic politics and it is confirmed by the highest administration agency. It is about the important decisions about the basic goals of operating and development. It is about the acceptance of basic principles values and rules. More than constraint of the state, the system is important, that is founded on the volunteer offer and creative cooperation. In the contemporary circumstances the creating of teams is getting most important for the creative cooperation, because they search the opportunities, solve the problems and in the end they take decisions. The current position of an organization with regard to the environment can be established by means of an initial processes, innovative operations and management review. The innovative operation is operation that, according to the production and all other its components is found on innovations. The initial review can cover the following:

- identification of legislative and regulatory requirements;
- identification of processes, innovative operations;
- identification of environmental aspects of its activities, products or services so as to determine those that have or can have significant environmental impacts and liabilities;
- evaluation of performance compared with relevant internal criteria, external standards, regulations, codes of practice and sets of principles and guidelines;
- existing business, processes, innovations, environmental management practices and procedures;
- identification of the existing policies and procedures dealing with procurement and contracting activities;
- feedback from investigation of previous incidents of non-compliance;
- opportunities for competitive advantage;
- the views of interested parties;

- functions or activities of other organizational systems that can enable or impede environmental performance [16].

The process and results of the initial environmental review should be documented and opportunities for EMS development should be identified. Such a partial approach can lead to technically and economically inappropriate solutions. The new model which promotes production processes innovation was derived from the model of managing company policy following the interest theory and business excellence. It was conceived in the frame and interdependence of both objective and subjective starting points of initial change agents as well as from process knowledge of process managers. New dimensions like business excellence, production processes innovation, companies' capacities and opportunities for continuous innovation, as well as values, knowledge, skills and feelings of change agents, will be added to the basic model [16].

Organizational systems or models need lean organization. Lean organization is first step of processes innovation and environmental protection. Possible measures, which the lean organization can encompass, include the fields of organizational measures, reconstruction of existing processes and products, the use of modern equipment and techniques as well as the introduction of new technologies. The dimensions of business excellence, especially production excellence, of production processes renovation, a company's or other organization's capacity to innovated as well as the values, knowledge, skills and feelings of production processes innovation agents, are added to the basic model [6]. The renovation of production processes results from lean organization, which is based on up-to-date technological and organizational starting points. Market need new consumers. Consumers need new products and services. Only innovative lean flexible organization could be the answer. Lean organization is market-driven; a buyer's market and innovation society prevail and acts as change generators in a company or other organization[16]. Figure 5 presents direct impacts of environmental issues on businesses.

3.3 BMW Corporate Philosophy: responsible Commitment

The process of market globalization has lead to many changes. Corporate responsibility now extends to encompass not only the needs of employees, but also

the environment and society as a whole. As industry grows in strength and importance, it is also being called upon to share the benefits of its growth with members of society. The global economic system needs to show a more human face. In this respect, companies must ensure that their traditional focus on corporate profits and shareholder value is accompanied by equal concern for the needs of society and the environment. The safeguarding and creation of jobs and commitment to the environment and society are just as important as innovative, problem-solving expertise and open dialogue. The principle of sustainable development is synonymous with this

philosophy. It is based on the fundamental belief that no generation should live at the expense of successive generations. In recent years this economic principle has evolved into a key factor determining entrepreneurial management. Companies that are committed to sustainability place equal importance on economic, ecological and social concerns in the formulation of their business strategies. In the BMW Group, sustainable business management has been a reliable contributor to the success of the Group's corporate philosophy for many years.

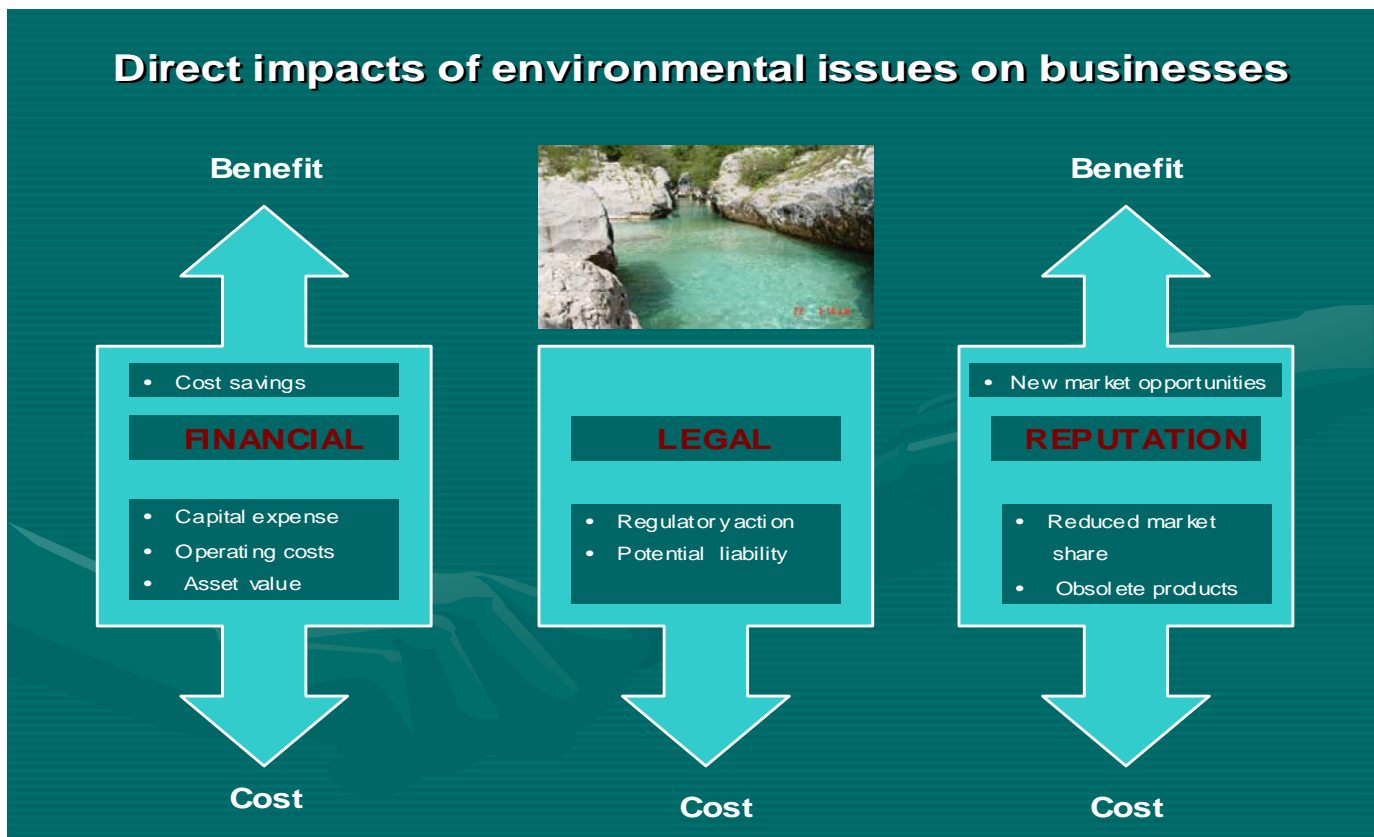


Figure 5: Direct impacts of environmental issues on businesses [19]

This is exemplified not only by the Group's integrated approach to environmental protection, and by its contributions to intelligent traffic concepts[15]. The BMW Group is also committed to the development of far-sighted models for planning of working hours. It offers extensive social benefits, and provides substantial funding of science, the arts and programmes for young professionals. It works towards maintaining a critical and open dialogue with

international partners from government and the public sector. It is the BMW Group's intention to ensure sustainability in the three target fields of resource efficiency, risk minimisation and reputation. Every individual within BMW Group is called upon to actively implement these objectives in their individual sphere of influence[15]. The result of this is that BMW have been a member of the "Dow Jones Sustainability Group Index" – the most important share index for companies dedicated to sustainable business

management – since 1999. The above-average rise in this index shows that companies can also reap financial benefits through active involvement in social and environmental concerns. The BMW Group considers this achievement a validation of our long-term, value-oriented corporate philosophy. As a leader of industry, we have firmly committed ourselves to applying principles of sustainability in all efforts devoted to the increase of company value. We will continue to make real contributions to the search for solutions to tomorrow's problems. The BMW Group's aim is to develop local and global perspectives of the future, and to meet the expectations placed on the corporation. In its fulfillment of environmental, social and political responsibility, at every location around the world, the BMW Group seeks to set an example of corporate responsible commitment [15]. Figure 6 presents BMW Sustainable development strategy.

In the business processes innovation model, there is the knowledge of business processes managers to be used to implement business process innovation policy in the following steps: vision, mission, strategy, tactics, and management processes [20]. The BMW Group has thus for many years consistently employed methods such as life Cycle Assessment and Design for Recycling in its decision making. The application of these holistic philosophies generates results that are often surprising – and decisive[15]. Figure 7 presents BMW Life Cycle Assessment and Design for Recycling

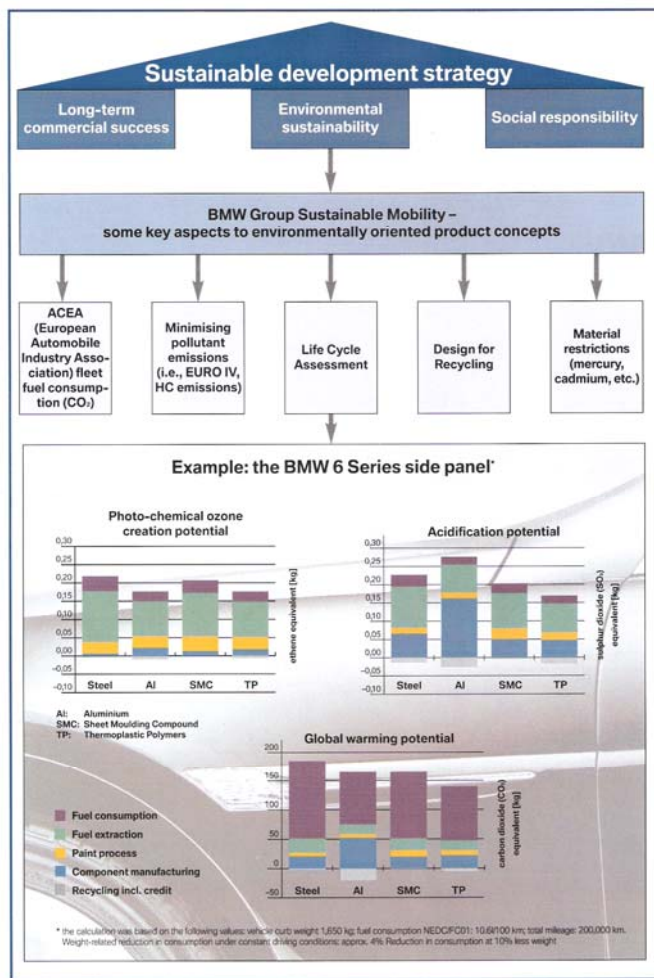


Figure 7: BMW Life Cycle Assessment and Design for Recycling

Through the years, the amount of recoverable plastics has increased with each successive BMW model. The combined weight of recyclable plastics in the various 3 Series generations, for example, progresses as follows:

First generation (1975-1982)	4 kg
Second generation (1982-1990)	9 kg
Third generation (1990-1998)	26 kg
Fourth generation (1998-)	43 kg

Figure 8 presents BMW End of life vehicle recycling process [15].

Figure 6: BMW Sustainable development strategy [15]

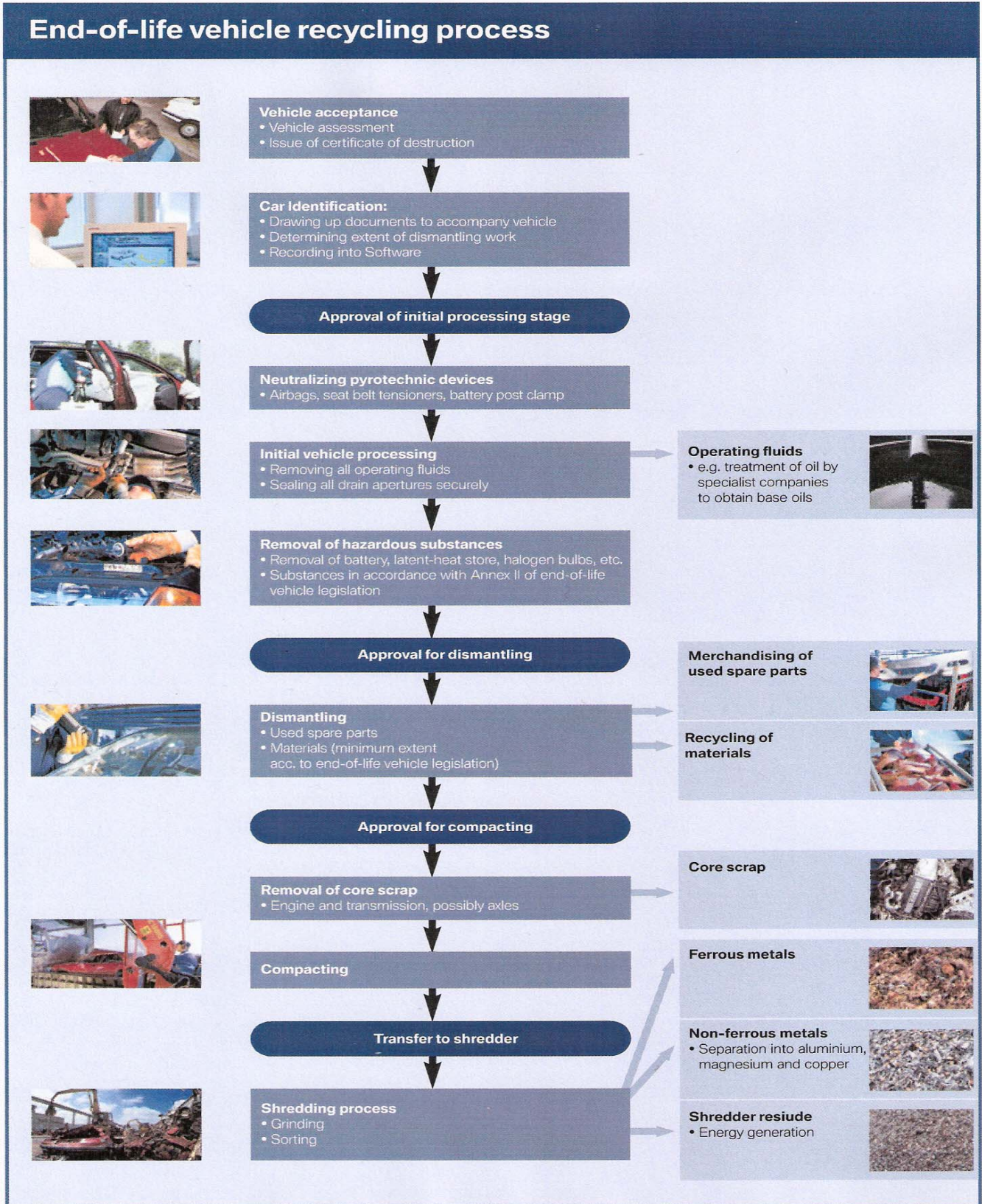


Figure 8: End of life vehicle recycling process [15]

Basic recycling methods:

Recycling quality: There are three different levels applicable to the recycling of ELVs:

- Reuse represents the highest form of recycling: the complete and useful parts and assemblies are removed and reconditioned, or directly employed again to fulfill their original function.
- Material recycling is dependent upon the removal and collection of plastics, metals, glass and other materials, separated by type to the highest degree possible. These are crushed and reused as starting materials in the manufacture of new components.
- Thermal recycling makes use of materials with a high energy content as a source of fuel to produce heat in the generation of electric power, for example

4 Conclusion

In this paper product responsibility is presented as a part of sustainable development and a tool for processes innovation. The importance of Product Responsibility is increasing within a broad range of industry areas. Therefore, what we should develop is an innovation management culture with Product Responsibility. Integrated products responsibility integrates the requirements of sustainable development and environmental management [6]. Product responsibility begins with development of products that are environmental friendly with continual improvement cycle and with processes innovations, even after their use, create the smallest possible environmental load.

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