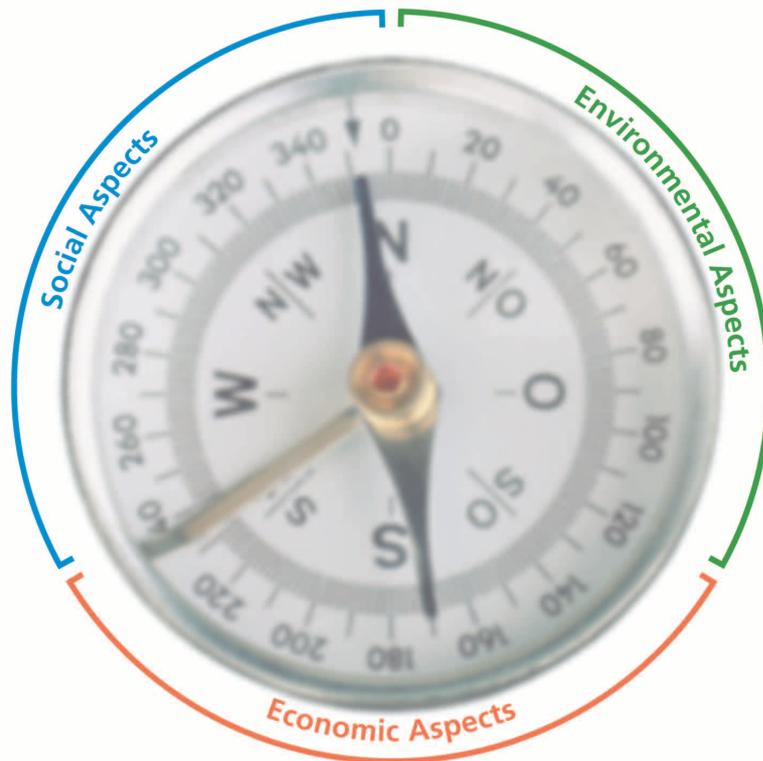




Towards a Sustainable Aluminium Industry: Stakeholder Expectations and Core Indicators



FinalReport

A project conducted by
Dipl.-Ing., M. Sc. Michael Kuhndt
Dipl.-Forstw., M. Sc. Justus v. Geibler
Dr. rer. nat. Christa Liedtke

in collaboration with André Eckermann

on behalf of the GDA
(Gesamtverband der Aluminiumindustrie)
and the European Aluminium Industry

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1. Framing Industrial Sustainable Development in the Aluminium Sector

1.1 Sustainable development – from macro to meso and micro level

Sustainable development remains a **formidable challenge** to the societies of the 21st century. A number of concepts have been put forward on how to reach sustainability at a macro-economic level. These concepts are based on different points of view of economic, social and environmental systems and their behaviour, and derived their legitimacy from economic and environmental theories. An overriding priority of companies attempting to promote sustainability at enterprise and sectoral level is to translate these broad concepts and the indicators behind them into specific concepts and measurable indicators useful in day-to-day business decisions. For companies and sectors it is important to know what kind of targets and actions will lead them on a path to sustainability. That is true for economic targets (high profit, high competitiveness, low investment payback, etc.), as for ecological (high life-cycle-wide resource productivity, low toxicity, high biodiversity, low erosion, etc.) and social targets (from employee satisfaction, a low unemployment rate to overall stability in society).

Studies such as "Industry and sustainable development"¹, "Sustainable Europe"², and the formation of local Agenda 21 initiatives by different communities and towns show **the first perspectives and guidelines** for a sustainable development for different actors. Different organisations (e.g. UNCSO, Eurostat, OECD, Enquete Commission of Inquiry, Forum Environment and Development) have already introduced sustainable targets and indicators on the macro, i.e. on the economic, level which, however, cannot automatically be applied to the aluminium industry. Furthermore, various concepts for implementation are suggested such as, for example, "Industrial Metabolism"³, "Cleaner Production"⁴, "Factor 4/10"⁵ "Eco-Efficiency"⁶, "management of resource flows"⁷ or "social accountability"⁸. In addition, both nationally and

¹ United Nations Commission on Sustainable Development (1998): Industry and sustainable development, New York, E/CN.17/1998/4.

² Spangenberg, J.H. (Ed.) (1996): Towards Sustainable Europe, A Study of the Wuppertal Institute for Friends of the Earth Europe, 2nd Edition, Wuppertal.

³ see: Ayres, R.; Simonis, U.E. (1994): Industrial Metabolism – Restructuring for Sustainable Development; United Nations University Press, Tokyo, Japan.

⁴ see: UNEP (1994): Cleaner Production; United Nations Environmental Programme Industry and Environment, Volume 17 No.4.

⁵ The Factor-4 and Factor-10 approach: the total resource productivity of a nation should be increased by a factor of 2 globally and a factor of 10 in industrialised countries within one generation, and by a factor of 4 within the next decade in order to redirect our course towards a sustainable economy. To achieve these factors every individual actor within the economy has to optimise its use of resources from the national (macro) level, over sector, regional (meso) levels on to the single firm and the household (micro level). The long time span is needed to allow the technical, social and economic dynamics to adapt and adjust without major conflicts with the requirements of economic sustainability. (Kuhndt, M, Liedtke, C. (1998): Translating a Factor X into Praxis, in: CONACOUNT Conference Report, Amsterdam, The Netherlands 1998 or Weizsäcker, E.U. von, A.B. Lovins, L. Hunter Lovins (1997): Factor Four – Doubling Wealth, Halving Resource Use, Earthscan Publications Ltd, London).

⁶ see: Fussler C. (1996): Driving Eco-Innovation, Pitman Publishing.

⁷ Haake J., M. Kuhndt, C. Liedtke, T. Orbach, H. Rohn, Firms and Dematerialisation (1998), in: Sustainability in question – the search for a conceptual framework, edited by J. Gowdy, F. Hinterberger, J. van der Straaten, J. Kühn, Cheltenham, UK: Eduard Elgon Publishing

⁸ Zadek, S; Pruzan, P; Evans, R. (1997): Building Corporate Accountability. Earthscan.

internationally all kinds of environmental targets and resource targets are suggested⁹. The OECD, UNCSD, and the European Environment Agency (EEA) are also working on indicators to describe the performance of national or regional economies with regard to sustainability and/or eco-efficiency.

Sustainable Development on the micro level should not be promoted by conventional restrictions of legal authorities. For business actors it seems more effective to integrate the sustainability concept **voluntarily** as a key strategy within their business activities. In that respect, sustainable development should be initiated by personal responsibility, involvement and on one's own initiative. However, as companies and industries often have divergent views on what is really encompassed by the term sustainable development, it is crucial to develop a more concrete view on the broad concept.

Sustainable Development should be seen as an **ongoing search process** with components of the past, the present and the future. A re-active position, i.e. no statements of a sector concerning Sustainable Development, will cause stakeholders' criticism because Sustainable Development cannot be reached without the contribution of every actor at all levels of economic activity. Thus, the different industry sectors should play a proactive role, which also enables them to influence the sustainability process.

The **European aluminium industry is committed** to sustainable development¹⁰ and has taken **proactive steps** related to sustainability. For example, in the autumn 1998 the seven largest European aluminium producers¹¹ launched the "Aluminium for Future Generations" initiative with a pan-European **consultation process**. As a basis for discussion, a consultation document was published which contained a profile of the European aluminium industry and explained the main issues. The consultation process consisted of twenty-four events, which took place in several European countries between October 1998 and June 1999. Primarily government officials, but also parliamentarians, academia and non-governmental organisations (NGOs) were part of this consultation process. The objectives were to enhance the dialogue between the aluminium industry and its stakeholders, to enhance the understanding of the interests and priorities of these stakeholders, and to raise awareness of the aluminium industry and its contribution to society, while at the same time, to open channels for a constructive criticism of its operations and activities. As an outcome of the consultation process, the European aluminium industry has released a response report of the "Aluminium for Future Generation" dialogue.¹² In addition, the actors within the aluminium industry have released other publications on sustainable development like, for example, the report on social

⁹ The "Ecocycle" Commission of the Swedish Government is driving for a Factor 10 within the next 25-50 years (Kretsloppsdelegationens Rapport 1997/13: Hallbrat Sa Klart – en Kretsloppstrategi", Stockholm), The Netherlands formulated a Factor 4 goal in their national environmental plan in 1996 (Ministry of Housing, Spatial Planning and the Environment. 1996: National Environmental Policy Plan, The Netherlands), Austria wrote a Factor 10 goal into their national environmental plan in 1995 (Austrian Government. 1995: National Environmental Action Plan, Vienna, Austria.). The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety suggested a 2.5-fold increase in raw material productivity by 2020 compared to 1993 and a 2-fold increase in energy productivity by 2020 compared to 1990. (The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. 1998: Sustainable Development in Germany – Draft Programme for Priority Areas in Environmental Policy, Bonn, Germany.)

¹⁰ See: <http://www.eaa.net/pages/environment/environment.html>

¹¹ Alcan, Alcoa, algroup alusuisse, Koninklijke Hoogovens (Corus), Hydro Aluminium, Pechiney and VAW aluminium AG.

¹² EAA (2001). Aluminium for future generation. Available (online) www.eaa.net/pages/fut_gen/fut_generat.html.

aspects of aluminium¹³ or Aluminium – A sustainable material from the German Aluminium Association.¹⁴

Regarding climate change, which is a major concern for many stakeholders, the European aluminium industry recognises the threat of global climate change, and is committed to actions to address this challenge. Over recent years priority has been given to reducing greenhouse gas emissions, in particular as the threat of global warming has become more evident. The aluminium industry has therefore invested in technology to reduce emissions, particularly Perfluorocarbons (PFCs). In many countries across Europe the industry has entered into national voluntary agreements to reduce greenhouse gas emissions.¹⁵

The activities listed are part of the continuous search process by the European aluminium industry towards sustainable development. A crucial element of such a process is the definition of a sustainability performance indicator set for the aluminium sector within the context of the current European/international debate.

1.2 Measuring sustainable industrial development – the need for indicators

Setting targets and monitoring performance with indicators are accepted as management tools used throughout business.¹⁶ In this regard, sustainability performance information is essential to respond to the increasing internal and external information demand along sustainable industrial development.

For **internal** decision-making, companies and sectors increasingly recognise the value of a detailed and balanced information basis. The advantages of an integrated approach to social, environmental and economic (triple-bottom-line) business goals have been shown in a variety of publications.¹⁷ In that sense, sustainability performance information can be useful at different levels: It can support management at the operational level to evaluate and continuously improve its performance and progress in order to comply with the regulation, to realise cost saving potentials as well at the strategical level, to benchmark the company or sector against competitors or to give guidance on investment decisions (for further information see chapter 4).

From an **external** perspective, industry is facing an increasing demand for sustainability information from different stakeholders and organisations. Examples are:

Financial institutions and insurance companies are increasingly taking triple-bottom-line business performance issues into account. 115 banks from 35 countries and 84 insurance companies have signed the “UNEP Statement by Financial Institutions on the Environment

¹³ Gesamtverband der Aluminiumindustrie (2001) Aluminium: Social aspects. Available (online): www.aluinfo.de/40.html.

¹⁴ Gesamtverband der Aluminiumindustrie (2001) Aluminium - A Sustainable Material. Available (online): www.aluinfo.de/40.html.

¹⁵ EAA (2001). Aluminium for future generation.

¹⁶ WBCSD (2000): Measuring Eco-Efficiency. A guide to reporting company performance

¹⁷ See for example: Claussen and Kottmann (1999). Umweltkennzahlen in Einsatz für das Benchmarking; Hroch and Schaltegger (2001) “Berücksichtigt die betriebliche Umweltberichterstattung aktuelle umweltpolitische Themen?”, to be published in UmweltFocus; Figge F.; Hahn, T.; Schaltegger, S.; Wagner, M. (2001). Sustainability balanced scorecard. Wertorientiertes Nachhaltigkeitsmanagement mit der Balanced Scorecard. Center for Sustainability Management. Lüneburg.

and Sustainable Development”¹⁸ in which they recognise that SD is the collective responsibility of government, business, and individuals. They are committed to working co-operatively within the framework of market mechanisms towards common environmental goals and to pursuing best practice in environmental management, including energy efficiency, recycling and waste reduction. Furthermore, they will seek to form business relations with partners, suppliers and subcontractors who similarly follow high environmental and social standards. As a response to the statement, an increasing number of financial institutions have developed or are developing investment funds with an ecological or/and social and/or ethical focus. For the assessment of companies they increasingly ask for relevant information like sustainability performance evaluation, benchmarking and sustainability rating; for a specific example see Box 1. The demand for sustainability information by financial institutions can act as a driver for companies to improve their performance. Internally, companies can use the external sustainability evaluation by financial institutions for their promotion, as an external decision support as well as an evaluation of their environmental or social performance relative to other companies.¹⁹

Box 1: Dow Jones Sustainability Index²⁰

The Dow Jones Sustainability Index (DJSI) was created in a joint venture by Dow Jones and SAM – a Swiss provider of asset management, private equity and research services for investors based on the sustainable value approach. The Dow Jones Sustainability Index (DJSI) contains the 2 to 3 most sustainable companies in *each of* the 68 industrial categories used in the Dow Jones family of indices – 227 companies in total from 22 countries. The starting point for the selection of companies for the DJSI is the 2000 companies in the Global Index with the highest market capitalisation. These are then rated based on the sustainability of their company-specific activities and on the sector as a whole. The rating is performed in the light of ten overall sustainable development trends – transparency of information; distribution of wealth; healthy living; ecological risk awareness; dematerialisation; climate warming; pricing of natural resources; pace of technology and innovation; lifelong learning; and intellectual capital. The company’s position with regard to the technologies which are deemed to be both sustainable and attractive in the marketplace, is also assessed. These evaluation processes produce a qualifier list from which the companies deemed to be the best performing in terms of shareholder value are selected for the investment list. The overall selection methodology is audited by PriceWaterhouseCoopers. The companies in the DJSI cover about 20 percent of the total capitalisation of the Dow Jones Global Index. Companies of the Aluminium Industry have taken part in this evaluation process and were awarded.

Governmental organisations and NGOs show a growing interest in the social strand of sustainability: in framing corporate social responsibility (CSR). The number of initiatives outlining approaches to CSR have rapidly increased over the last 3 years (see the following figure). These initiatives have been led by different national and international governmental bodies, by business and civil society organisations. Much effort has been expended to agree on standardised information demands. However, so far just a few tools for sustainable business development have been standardised, like the AA1000 for social auditing (see chapter 2).

¹⁸ UNEP Division of Technology, Industry and Economics, Economics and Trade Unit (2000): Financial Services Initiatives. Available (online): <http://www.unep.ch/etu/finserv/fimenu.htm>.

¹⁹ Orbach, T., Kuhndt, M. and von Geibler, J. (forthcoming). Financial Institutions – A Driver for Sustainable Industrial Development. Wuppertal Institute Paper.

²⁰ Flatz, A. (2000): Presentation at the International Workshop organised by INETI, Portuguese Directorate-General of Industry and the European Commission. Lisbon 1-3 March 2000.

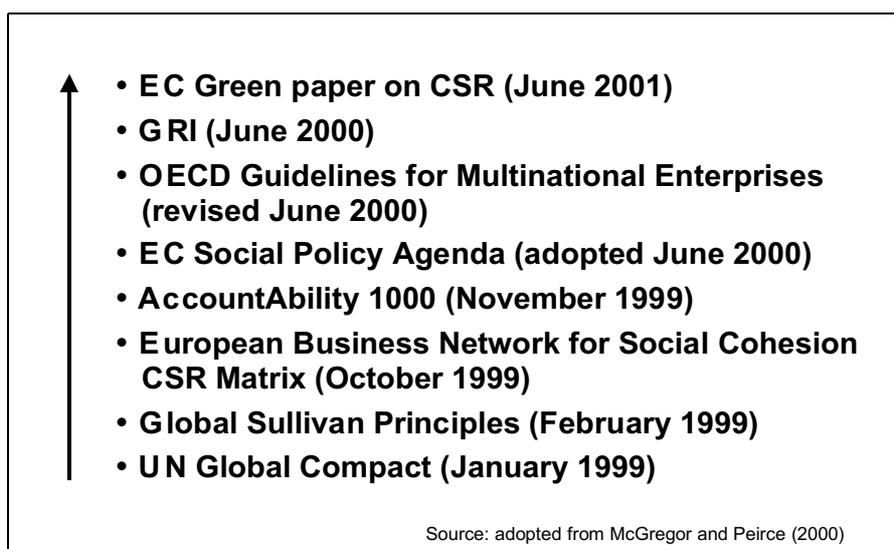


Figure 1.1: Some recent developments in corporate social reporting.

NGOs and media increasingly play an important role in demanding and disseminating information on sustainable business development. For example, the environmental group Greenpeace was a relevant actor in changing companies such as Shell, which is now a recognised leader in reporting its social performance.

Sustainability performance information about the sector and of single companies can provide reliable information that is relevant to the needs and interests of these stakeholders and may invite further dialogue and enquiries. In the international context, sector specific indicator sets can contribute to discussions about environmental and sustainability performance assessment and reporting taking place in such arenas as Integrated Product Policy (IPP) and/or the Global Reporting Initiative (GRI, see chapter 2).

In conclusion, business actors need indicators in order to effectively promote their voluntary activities towards sustainable development, to accurately grasp the scope of the impacts they are generating and to access the outcome of the measures they are taking. Hereafter, indicators increasingly continue to play a crucial role in the corporate development towards a more sustainable future.

1.3 Using COMPASS for designing an indicator set for the aluminium industry

The Wuppertal Institute has recognised the decision-makers' need in business to provide transparent information about their performance to external stakeholders and to obtain an internal information basis on economic, social and environmental aspects in order to evaluate and continuously improve their performance and progress. As a response, in 1998 the Eco-Efficiency and Sustainable Enterprise Team defined a methodology named COMPASS. COMPASS (companies' and sectors' path to sustainability)²¹ helps to select – according to a Plan-Do-Check-Act management cycle – a set of indicators to measure economic, social and environmental performance. COMPASS supports step by step the understanding of what the life-cycle-wide impacts of the sector in different performance issues are. The methodology

²¹ Kuhndt, M., Liedtke, C. (1998): COMPASS – Companies' and Sectors' Path to Sustainability – The Methodology, Wuppertal Institute, Wuppertal Paper, Wuppertal, Germany.

provides information to enable decision-makers to optimise products and services towards a sustainable satisfaction of demand.

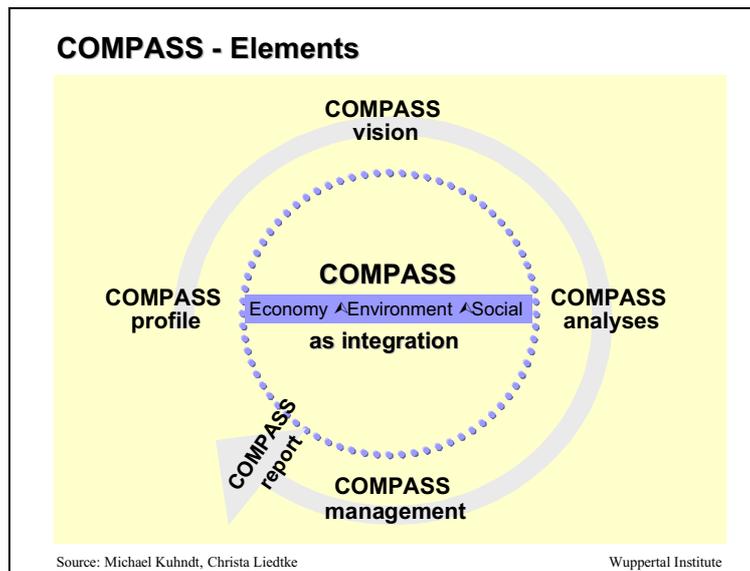


Figure 1.2: Elements of COMPASS

COMPASS combines five elements (Figure 1.2):

- **COMPASS_{profile}** aims at describing the state of knowledge about economic, social and environmental performance issues within the organisation/sector and the expectations of different stakeholders facing the organisation/sector.
- **COMPASS_{vision}** defines targets to be reached and selects a set of indicators in relation to the targets set.
- **COMPASS_{analyse}** explores the distance-to-target by performance measurement and benchmarking.
- **COMPASS_{management}** finally ensures the translation of the target set and indicators selected into decision-making processes by providing suitable management instruments.
- In **COMPASS_{report}** a communication plan is prepared that helps to report (according to international standards and guidelines, like provided by ISO and GRI) to an internal or external audience on performance improvements and achievements.

In order to communicate aggregated results for internal decisions-making processes **COMPASS_{radar}** can be used (see the following Figure for an example from the housing sector).

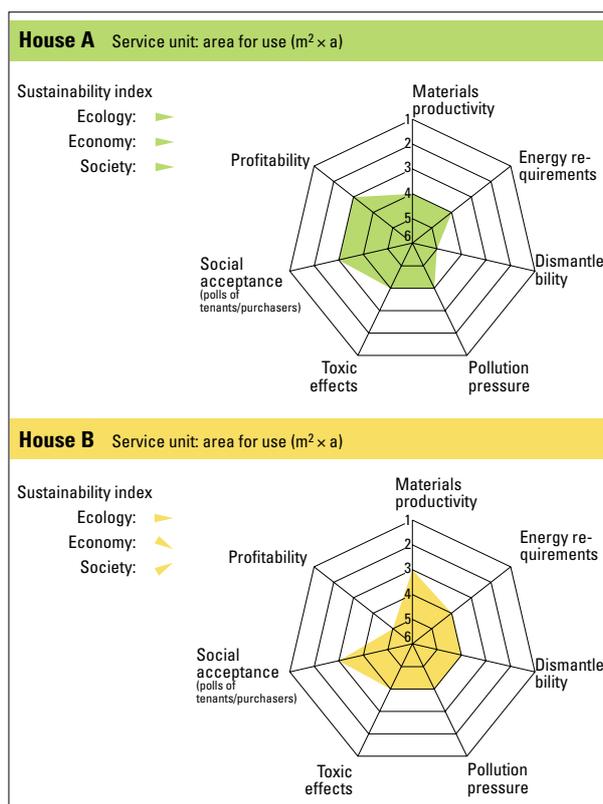


Figure 1.3: Comparison of two houses.

Considering the given time frame within this project, COMPASS has been adapted to a tailor-made “Aluminium Sector COMPASS” including 3 elements:

1. **COMPASS agenda profile**
2. **COMPASS stakeholder profile**
3. **COMPASS analysis**

These elements are the foundation for prospective future efforts to define a sectoral sustainability vision, to implement harmonised sustainability measures among a large group of companies and to report to external stakeholders about the sectoral performance.

1.4 The Aluminium Sector COMPASS – The project outline

The project’s objective has been to define sustainability issues within the aluminium sector within the context of the European/international debate. Derived from this, sustainability indicators for aluminium and the European aluminium industry have been critically discussed and a set of sustainability indicators has been suggested. This first indicator set should reflect the actual discussion in politics and science and should be suitable for the aluminium industry to take a position. Taking into account the equity of the economic, ecological and social aspects of sustainability, this project focuses on the areas of eco-efficiency and social aspects.

The project has been organised according to COMPASS elements in three work packages (Figure 1.4). The review and survey of stakeholder expectations have been central elements of the project.

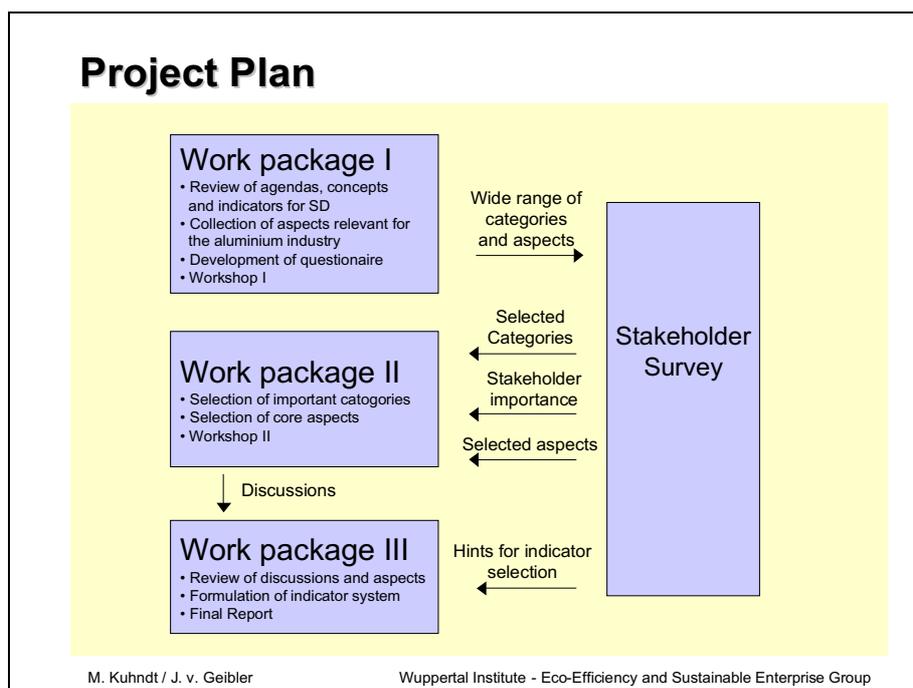


Figure 1.4: Project Work Plan

COMPASS agenda review (work package I): Review of existing agendas, concepts and indicators on Sustainable Development

In order to develop sustainability performance indicators at the sector level which are relevant to the aluminium industry, a thorough review of ongoing efforts at the regional, national and international level has been performed to develop broad indicators of sustainability. Where do governments, non-governmental organisations (e.g. research institutes, universities, trade unions), actors representing consumer needs (e.g. consumer organisations) and business (individual enterprises and business associations) in Europe address sustainability targets and indicators relevant to the aluminium industry? What are the stakeholders' demands on companies and whole business sectors towards Sustainable Development? Which qualitative and quantitative indicators are classified? The review has covered environmental and economic aspects (eco-efficiency) as well as social aspects (sustainable development). The results of the agenda review have been presented at a workshop (see chapter 2).

COMPASS stakeholder review (work package 2): What is needed for sustainability – core aspects in the aluminium industry

In order to specify an indicator set for the European aluminium industry that provides past and current issues and future trends, the opinions and expectations of different aluminium industry actors and its external stakeholders, as well as life cycle issues are considered. Based on the broad collection of expectations in work package 1, sector specific economic, social and environmental core categories and aspects have been identified in work package 2 in the form of a stakeholder survey and different workshops (see chapter 3).

COMPASS analysis (work package 3): Formulation of an indicator set for the aluminium sector

The review of the sustainability discussion (work package 1) and the determination of core aspects in the aluminium industry (work package 2) resulted in the development of a first balanced set of qualitative and quantitative indicators for economic, ecological and social sustainability in the aluminium sector (see chapter 4).

2. Agendas for Sustainable Development

2.1 Introduction

Different sustainability agendas have been set up by various stakeholders (political institutions, consumer associations, NGOs, enterprises, sectors). Some of the principal policy and business agendas now being pursued include: expanded application of economic instruments to environmental management; measures to encourage eco-efficient production patterns and corporate social responsibility; supply and demand-side management strategies; increasing public participation in business and policy development; information and public awareness programmes; product performance target and policies and guidelines for reporting. Additionally, the quest for sustainable consumption and production patterns requires a broadly accepted set of qualitative and quantitative targets, and indicators to measure and monitor progress. A variety of regional, national and international efforts relevant to industry are already underway. This chapter intends to provide an overview on sustainable development agendas (i.e. an initiative, tool or publication) on the international level. Categories and aspects identified in these agendas provide input for designing the questionnaire for the stakeholder survey.

2.2 Overview of relevant sustainable development agendas

The following tables summarise agendas from policy-makers, multi-stakeholder initiatives, financial institutions, business and NGOs which are relevant to the aluminium industry in general or in specific terms as they present/include major stakeholder views on important sustainability categories and aspects. Looking at the summary, it might appear that some groups – like NGOs – are underrepresented and others – like academia – are missing. Taking into account that other groups show special engagement in multi-stakeholder processes, this seems reasonable.

The agendas are summarised in two tables. Table 2.1 describes the background of the agenda according to the following criteria:

- **Background Information:**
 - **Leading Organisation:**
name of the organisation heading the initiative / tool / publication
 - **Initiative / Tool / Publication:**
name of the initiative / tool / publication referred to as an agenda for sustainable development
 - **Type of Initiative / Tool / Publication:**
classification of the initiative / tool / publication
 - **Start-up:**
date of the founding of an initiative, the beginning of a tool elaboration process and/or the date of the publication of the document referred to
 - **Participants:**
individuals / groups / organisations participating in the work and/or elaboration of the initiative / tool / publication

- **Accreditation / Observance:**
remarks on accreditation possibilities of the agenda – and mechanisms for monitoring compliance

- **Web-Address:**
web-address of the leading organisation / initiative / tool / publication.

Table 2.2 highlights the following:

- **Core Mission:**
brief description of the main objectives of the initiative / tool / publication

- **Content of the Initiative / Tool / Publication:**
brief summary of the publication referred to as an agenda for sustainable development

- **Linkages:**
indication of links between the respective agenda and other agendas for sustainable development

The annex contains a more detailed description of each agenda listed in the tables.

Table 2.1: Background information to agendas for sustainable development

Leading Organisation	Initiative / Tool / Publication	Type of Initiative / Tool / Publication	Start-up	Participants	Accreditation / Observance	Web-Address
United Nations (UN)	Agenda 21	global agreement (not binding)	1992	<ul style="list-style-type: none"> government representatives from more than 178 countries consultation of other stakeholder groups 	<ul style="list-style-type: none"> official adoption by more than 178 countries 	www.un.org/esa/sustdev/agenda21.htm
Commission on Sustainable Development (CSD)	Indicators of Sustainable Development: Framework and Methodologies	report to the CSD's 9 th session	founded in December 1992; since 1995 work on indicators	<ul style="list-style-type: none"> government representatives as official members other stakeholders (NGOs, business etc.) accredited to participate 	---	www.un.org/esa/sustdev/csd.htm
International Labour Organisation (ILO)	ILO documents	UN standards (conventions, recommendations) and declarations	several documents since foundation in 1919	<ul style="list-style-type: none"> ca. 350 members, out of which approximately 175 are countries 	<ul style="list-style-type: none"> ratification obligates countries to ensure implementation and reporting monitoring mechanism also on ILO level in place 	www.ilo.org
Organisation for Economic Co-operation and Development (OECD)	The OECD Guidelines for Multinational Enterprises (MNEs)	code of conduct for MNEs	1976, Revision 2000	<ul style="list-style-type: none"> OECD staff, business community, labour representatives, NGOs, non-member governments 	<ul style="list-style-type: none"> national observance monitoring through National Contact Points (NCP) in member countries international observance monitoring through the OECD Committee on International Investment and MNEs (CIME) 	www.multinationalguidelines.org/oecd www.oecd.org
EU Commission	European Commission's Green Paper on Corporate Social Responsibility (CSR)	EU Commission Green Paper	July 18 th 2001	<ul style="list-style-type: none"> EU Commission elaborated the Green Paper as a first Draft for a European Framework on CSR stakeholders at all levels invited to comment the Green Paper 	---	www.europa.eu.int/comm/off/green/index_de.htm
U.K. Department of the Environment, Transport and the Regions (UK DETR)	Quality of life counts	research report	May 17 th 1999, Final Report	<ul style="list-style-type: none"> UK government Further stakeholders outside the government consulted 	---	www.detr.gov.uk
United Nations (Secretary General)	UN Global Compact	code of conduct	1999 announcement; 2000 formal launch	<ul style="list-style-type: none"> UN bodies, participating companies, labour and NGOs 	<ul style="list-style-type: none"> engagement by commitment to the principles through a letter of the CEO no observance mechanisms in place 	www.unglobalcompact.org
Global Reporting Initiative (GRI)	Sustainability Reporting Guidelines on economic, environmental and social performance	private international standard	1997; June 2000 publication of reporting guidelines	<ul style="list-style-type: none"> business community, UN, labour, environmental, and human rights groups, accountancy and industry associations 	<ul style="list-style-type: none"> voluntary verification possible no standardised verification mechanism in place 	www.globalreporting.org
International Organization for Standardization (ISO)	ISO 14031	private international standard	first edition of ISO 14031 November 5 th 1999	<ul style="list-style-type: none"> primarily: ISO bodies and standards-setting organisations from ISO member countries involvement of various other stakeholder groups in the standards elaboration 	<ul style="list-style-type: none"> verification / certification not possible (not intended) 	www.iso.ch

Leading Organisation	Initiative / Tool / Publication	Type of Initiative / Tool / Publication	Start-up	Participants	Accreditation / Observance	Web-Address
Social Accountability International (SAI)	SA 8000	private international standard	1997; October 1997 publication of SA 8000	<ul style="list-style-type: none"> SAI multistakeholder advisory board, companies and their suppliers, trade associations, unions and workers, auditing firms, NGOs, government representatives, multi-lateral organisations 	<ul style="list-style-type: none"> verification possible accreditation of verifiers by SAI 	www.cepaa.org
AccountAbility. Institute of Social and Ethical Accountability	AA 2000. Consultation briefing 1	private international standard	1999 launch of AA 1000; launch of AA 2000 in April 2002	<ul style="list-style-type: none"> International Council of AccountAbility, members from many different stakeholder groups including business, non-profit, academic and consultancy organisations 	<ul style="list-style-type: none"> not yet known 	www.accountability.org.uk
United Nations Environment Programme (UNEP)	UNEP's Financial Institutions Initiative	partnership between UNEP and Financial Institutions	1992	<ul style="list-style-type: none"> UNEP staff, financial institutions, insurance industry 	<ul style="list-style-type: none"> simple sign-in mode by a registration form 	www.unepfi.net
Dow Jones Sustainability Group Indexes (partnership of Dow Jones & Company and Sustainable Asset Management (SAM))	Dow Jones Sustainability Group Index	Stock market index	launched December 1998	<ul style="list-style-type: none"> Dow Jones & Company SAM Advisory Committee 	<ul style="list-style-type: none"> selection of index companies through a corporate sustainability assessment conducted by SAM annual index update based on ongoing monitoring process 	www.sustainability-indexes.com
International Chamber of Commerce (ICC)	ICC Business Charter for Sustainable Development	code of conduct	Launched April 1991	<ul style="list-style-type: none"> ICC staff, ICC member companies 	<ul style="list-style-type: none"> simple sign-in mode no observance mechanisms in place 	www.iccwbo.org/home/environment/charter.asp
World Business Council for Sustainable Development (WBCSD)	Measuring Eco-Efficiency	WBCSD reports	1991 development of eco-efficiency concept; last report August 2000	<ul style="list-style-type: none"> ca. 150 international companies as members consideration of other stakeholders in the WBCSD work each report is the product of a working group, comprising executives of member companies, mandated to address a particular topic, often drawing on the advice of internationally known experts from diverse stakeholder groups 	---	www.wbcSD.org
	Corporate social responsibility: making good business sense		1998 launch of CSR programme; last report January 2000			
Corporate Social Responsibility Europe (CSR Europe)	Communicating Corporate Social Responsibility	voluntary guidelines	1998 launch of communication and reporting programme	<ul style="list-style-type: none"> over 40 member companies 15 national partners 	<ul style="list-style-type: none"> no accreditation mechanism no observance mechanism 	www.csreurope.org
Amnesty International (AI) and Prince of Wales Business Leaders Forum (PWBLF)	Human rights - is it any of your business?	study by AI and PWBLF	Published April 2000	<ul style="list-style-type: none"> AI PWBLF indirect participation of several companies in case studies 	---	www.amnesty.org.uk/business www.pwblf.org

Table 2.2: Description of agendas for sustainable development referring to their core mission, content and linkages to other agendas

Leading Organisation	Agenda: Initiative / Tool / Publication	Core Mission	Content of the Initiative / Tool / Publication	Linkages
United Nations (UN)	Agenda 21	<ul style="list-style-type: none"> provide a comprehensive plan of action to be taken globally, nationally and locally by organisations of the United Nations System, Governments, and Major Groups in every area in which there are human impacts on the environment. 	<ul style="list-style-type: none"> preamble social and economic dimensions conservation and management of resources for development means of implementation 	<ul style="list-style-type: none"> basis document for various others
Commission on Sustainable Development (CSD)	Indicators for Sustainable Development: Framework and Methodologies	<ul style="list-style-type: none"> provide a framework for the development and selection of sustainability indicators to monitor progress towards sustainable development at the national level ensure a high level of practicability and acceptance through intensive pilot testing 	<ul style="list-style-type: none"> Overview of the CSD's work programme on indicators of sustainable development description of the new indicator framework, the selected themes, sub-themes and indicators 	<ul style="list-style-type: none"> agencies involved in the indicator development are indicated in the methodology sheets provided for each indicator
International Labour Organisation (ILO)	ILO standards	<ul style="list-style-type: none"> establish norms covering all aspects of working conditions and industrial relations ensure that member countries respect, promote and realise these norms, especially the principles concerning the fundamental rights at work 	<p>basic human rights in the workplace, including:</p> <ul style="list-style-type: none"> freedom of association right to organise and to collective bargaining minimum age freedom from discrimination freedom from forced labour and avoidance of child labour 	<ul style="list-style-type: none"> Universal Declaration of Human Rights ILO Tripartite Declaration of Principles Concerning Multinational Enterprises and Social Policy takes the OECD Guidelines for MNEs into account
Organisation for Economic Co-operation and Development (OECD)	The OECD Guidelines for Multinational Enterprises (MNEs)	<ul style="list-style-type: none"> encourage responsible business practices enhance MNE's contribution to sustainable development strengthen government-business relationships 	<ul style="list-style-type: none"> voluntary policies that promote corporate transparency and accountability worldwide covering human rights, labour standards, environment, corruption and information disclosure 	<ul style="list-style-type: none"> Declaration on International Investment and MNEs Commitment of the EU Commission to actively promote the guidelines OECD Guidelines for MNEs refer to ILO standards
EU Commission	European Commission's Green Paper on Corporate Social Responsibility (CSR)	<ul style="list-style-type: none"> initiate a wide debate on CSR at all levels development of a CSR framework (in the long run) 	<ul style="list-style-type: none"> EU Commission's view on a broad range of CSR topics, initiatives and tools 	<ul style="list-style-type: none"> EU initiatives, e.g. sustainable development strategy, eEurope reflection of non-European initiatives in a European approach (e.g. ILO Declarations, OECD Guidelines for MNEs, UN Global Compact)
U.K. Department of the Environment, Transport and the Regions (UK DETR)	Quality of life counts	<ul style="list-style-type: none"> support the performance measurement of sustainable development provide a benchmark for a performance evaluation 	<ul style="list-style-type: none"> description of the indicator development and selection application of the indicator set analysis of results 	<ul style="list-style-type: none"> Agenda 21
United Nations (Secretary General)	UN Global Compact	<ul style="list-style-type: none"> build the social and environmental pillars required to sustain the new global economy make globalisation work for all the world's people, based on commitment to universal principles 	<ul style="list-style-type: none"> 9 business operating principles in the areas of human rights, labour and environment 	<ul style="list-style-type: none"> UN Global Compact labour principles refer to ILO standards

Leading Organisation	Agenda: Initiative / Tool / Publication	Core Mission	Content of the Initiative / Tool / Publication	Linkages
Global Reporting Initiative (GRI)	Sustainability Reporting Guidelines on economic, environmental and social performance	<ul style="list-style-type: none"> forge the link between environmental and economic performance elevate sustainability reporting to a level equivalent to financial reporting through a standardised reporting framework 	<ul style="list-style-type: none"> general reporting guidance reporting principles and practices, including indicator proposals description of the elements of a report according to GRI 	<ul style="list-style-type: none"> GRI has been an open multi-stakeholder process from the very beginning. As such it reflects many other sustainable development agendas.
International Organization for Standardization (ISO)	ISO 14031	<ul style="list-style-type: none"> offer an internal management tool designed to provide management with reliable and verifiable information on an ongoing basis to determine whether an organisation's environmental performance is meeting the criteria set by management 	<ul style="list-style-type: none"> relevant terms and definitions description of the environmental performance evaluation process supplemental EPE guidance section in the annexes 	<ul style="list-style-type: none"> supports the requirements in ISO 14001 and ISO 14004
Social Accountability International (SAI)	SA 8000	<ul style="list-style-type: none"> improve labour conditions through a human workplace standard, a verification system and public reporting 	<ul style="list-style-type: none"> labour rights implementation guidance for management certification of corporate facilities 	<ul style="list-style-type: none"> ISO 9000 and 14001 aspects of working conditions addressed in ILO declarations
Accountability. Institute of Social and Ethical Accountability	AA 2000. Consultation briefing 1	<ul style="list-style-type: none"> improve the accountability and overall performance of organisations by increasing quality of social and ethical accounting, auditing and reporting 	<ul style="list-style-type: none"> stakeholder involvement, integrating different management systems, reporting and assurance, managing learning through governance processes 	<ul style="list-style-type: none"> GRI UN Global Compact Global Alliance for Workers and Communities The Copenhagen Centre
United Nations Environment Programme (UNEP)	UNEP's Financial Institutions Initiative	<ul style="list-style-type: none"> engage a broad range of financial institutions in a constructive dialogue about sustainable development issues identify, promote, and realise the adoption of best sustainability practice at all levels of financial institution operations. 	<ul style="list-style-type: none"> commitment to sustainable development environmental management and financial institutions public awareness and communication 	<ul style="list-style-type: none"> ISO 14001 GRI
Dow Jones Sustainability Group Indexes (partnership of Dow Jones & Company and Sustainable Asset Management (SAM))	SAM Questionnaire – Aluminium Industry	<ul style="list-style-type: none"> ranking of sustainability leader companies for investment purposes according to their management of sustainability opportunities and risks 	<p>Assessment based on:</p> <ul style="list-style-type: none"> sustainability policy and strategy management of general and industry-specific sustainability-related opportunities and risks corporate data 	<ul style="list-style-type: none"> the questionnaire asks for implementation / verification / signatory of sustainability-related standards / codes of conduct / guidelines etc.
International Chamber of Commerce (ICC)	ICC Business Charter for Sustainable Development	<ul style="list-style-type: none"> encourage continuous improvement in environmental management and practice commitment of the widest range of enterprises to the charter's principles assist enterprises in fulfilling their commitment 	<ul style="list-style-type: none"> principles for environmental management introduction on sustainable development and business 	<ul style="list-style-type: none"> ISO 14000 UNEP's work on environmental management

Leading Organisation	Agenda: Initiative / Tool / Publication	Core Mission	Content of the Initiative / Tool / Publication	Linkages
World Business Council for Sustainable Development (WBCSD)	Measuring Eco-Efficiency	<ul style="list-style-type: none"> reduce business impact on the environment while continuing to grow and develop 	<ul style="list-style-type: none"> reasons for measuring and reporting eco-efficiency demands on indicators and indicator presentation guidance on indicator development and selection measurement and reporting experiences from the pilot programme 	<ul style="list-style-type: none"> served as input for GRI recommends ISO 14031 review for indicator selection recommends ISO 14040 review for life-cycle issues
	Corporate social responsibility: making good business sense	<ul style="list-style-type: none"> increase the understanding of CSR in the business community, including the following aspects: interdependent nature of the business-society relationship, contribution of CSR to long-term prosperity, the role of stakeholder dialogue offer a navigator to guide companies in the implementation of CSR in daily business practice 	<ul style="list-style-type: none"> definition and illustration of the CSR concept and its development practical steps and hands-on tools, including a CSR implementation framework and a CSR navigator highlighting key issues 	<ul style="list-style-type: none"> contribution to GRI's social indicators suggests review of AccountAbility, GRI, SustainAbility "Social Report"
Corporate Social Responsibility Europe (CSR Europe)	Communicating Corporate Social Responsibility	<ul style="list-style-type: none"> encourage companies to voluntary external reporting on social and environmental performance across all company operations encourage companies to use a variety of communication methods provide a CSR reporting approach 	<ul style="list-style-type: none"> guideline objective 4-step reporting approach performance indicator checklist 	<ul style="list-style-type: none"> contribution to the EU Commission's CSR work
Amnesty International (AI) and Prince of Wales Business Leaders Forum (PWBLF)	Human rights - is it any of your business?	<ul style="list-style-type: none"> inform companies on business relevant human rights aspects assist companies in developing adequate human rights policies 	<ul style="list-style-type: none"> illustration of links between human rights and business practice company case studies list of relevant resources (organisations, websites, publications) 	<ul style="list-style-type: none"> the study makes references to a wide range of agendas, including the Universal Declaration of Human Rights, ILO standards, UN Global Compact, SA 8000, AA 1000

3. Identifying Stakeholder Expectations

This chapter summarises the stakeholder survey process and its results. The aim of the survey was to gather data on stakeholder expectations regarding sustainable development in the aluminium industry. For this, a questionnaire-based method has been selected. This method requires the development of the questionnaire, the selection of participants, conducting the survey as well as the analysis of the responses.

3.1 Development of the questionnaire

The structure of the questionnaire (included in the appendix) reflects its specific aims: to gather external reporting expectations, views on the importance of different stakeholders and different aspects in the aluminium life cycle. These three issues are main elements (part 3 to 5) of the questionnaire. Additionally, it includes questions for registration data and general information (part 1 and 2) and allows general comments by the respondent (part 6). In *part 3*, reporting expectations for different sustainability aspects are covered. The list of different aspects has been developed on the basis of the review of agendas for sustainable business development (see chapter 2). The respondent has been asked to evaluate these aspects according to the perceived importance (not relevant, less important, important, highly important, no opinion). For a comparative analysis the questionnaire allows answers for both industry in general and the aluminium industry.

Part 4 of the questionnaire is focused on the views on stakeholders of the aluminium industry. Here, a list of potentially relevant stakeholders has been developed. Each stakeholder can be assessed as less important, important, highly important. Additionally, space for additional stakeholders and comments is given.

Part 5 of the questionnaire refers to the aluminium life cycle. Two questions regarding the major human needs aluminium is satisfying today and the biggest challenges for the aluminium industry on its way towards sustainability are given. A third question focuses on the importance of different aspects in the aluminium life cycle. For life cycle phases, a list of economic, environmental and social aspects has been suggested based on a review of literature on aluminium (see literature list). The option to add other aspects is given for each life cycle phase.

3.2 Selection of participants

In order to gather views from different perspectives, survey participants should be selected from a wide range of different political, social, and economic stakeholder groups. In total nine stakeholder groups have been chosen: Companies within the aluminium industry; industry associations and labour unions; academia/science; consumers of the aluminium industry; governmental organisations; financial experts; consumer organisations; environmental NGOs and social NGOs. Within each group about 6 people were selected in consensus with representatives from the Wuppertal Institute and the aluminium industry. The selection aimed at a balance of social, environmental and economic views and a cross European approach.

A list of institutions approached to fill in the questionnaire is given in the appendix. For anonymity and confidentiality the experts' names will not be specified.

3.3 Conducting the survey and analysis of the response

The survey was sent out to the 54 selected participants via electronic and postal mail mid-February 2001. All survey participants were asked to respond to all questions, except the questions about the aluminium life cycle, which were left as optional in case of specific knowledge in this area.

In order to analyse the survey responses, the respondents were categorised into the following groups: all stakeholders, internal and external stakeholders.²² For the analysis of the questions, to which the respondents expressed their perceived importance in ordinary scale, the answers were transformed into a quantitative scale (not relevant => 0, less important => 1, important => 2, highly important =>3). This transformation enables the aggregation of responses of the different stakeholders and their visualisation in the form of average figures and different forms of diagrams.

3.4 Survey results

3.4.1 Response by survey participants

The following table presents the responses (from completed questionnaires) by different stakeholder groups.

Table 3.1: Responses of the stakeholder survey by stakeholder groups.

Stakeholder group	Response
Companies within the aluminium sector and recycling associations	7/7
Industry associations and labour unions	4/6
Academia / research institutions	3/6
Customers of the aluminium industry	3/6
Governmental organisations	2/6
Financial Institutions	4/6
Consumer organisations	1/6
Environmental NGOs	2/5
Social NGOs	2/6
Total	28/54

Out of the 54 survey experts, 28 answered and sent back a completed questionnaire. Two respondents gave content-oriented comments via phone or mail without filling in the questionnaire. 23 experts answered the optional part 5 of the questionnaire. Generally, just a few additional comments were added. In all cases added categories and aspects could be categorised under another already existing item. Additionally, most respondents expressed interest in being involved further within the project.

3.4.2 Categories of stakeholders' concern

In Part 3 of the questionnaire, external reporting expectations have been gathered. The answers were analysed for all respondents (comparing expectations on industry in general and the aluminium industry) as well as for internal and external stakeholders.

²² More detailed categorisation was not possible due to limited responses in specific stakeholder groups.

Which type of information do stakeholders expect from industry in general and the aluminium industry, specifically?

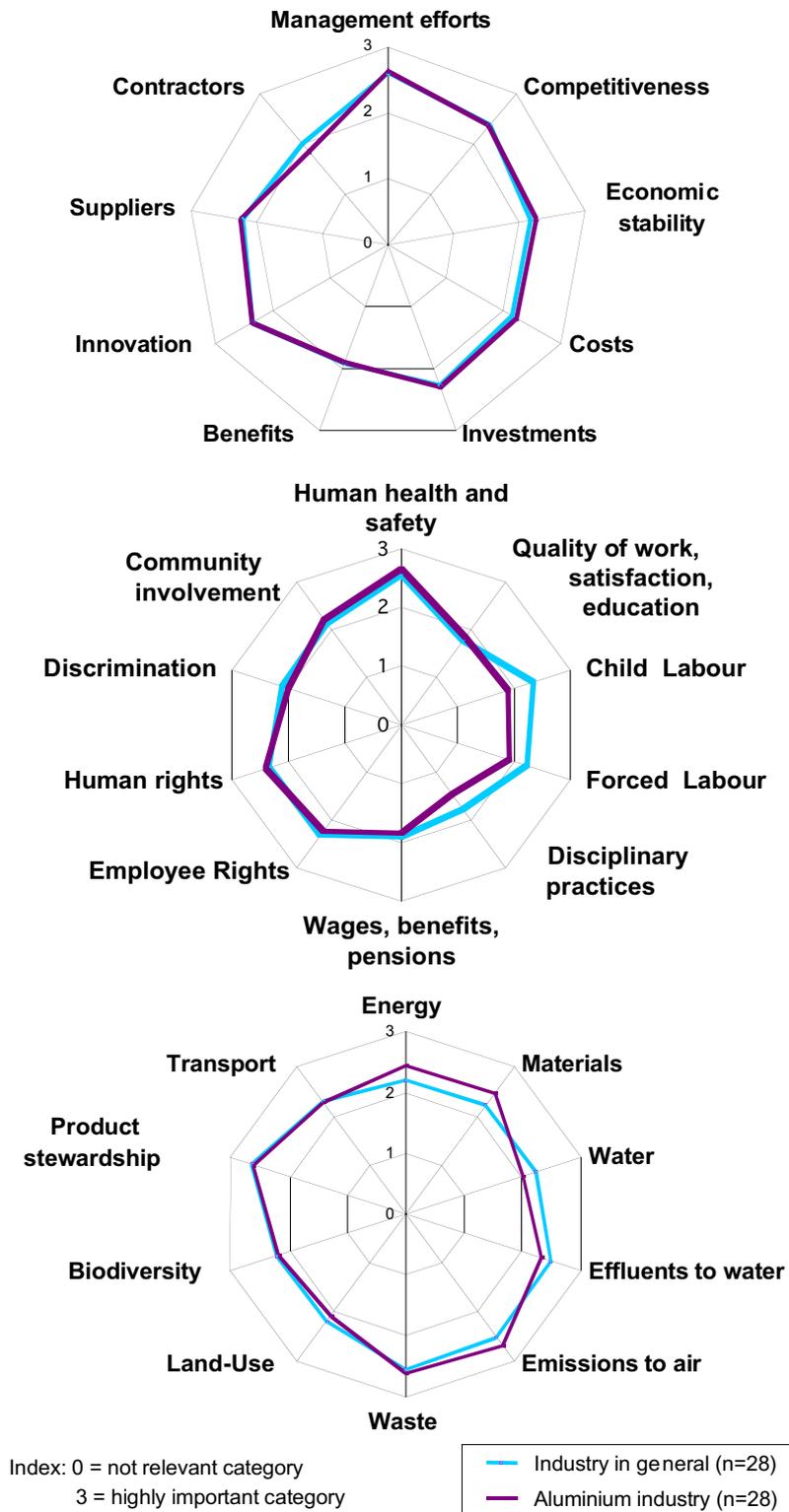


Figure 3.1: Comparison of sustainability-reporting demands for industry in general and for the aluminium industry.

In general, all of the categories in the questionnaire have been considered as being important (with an average value larger than 1.5 in the ordinary scale used) and most of them with equal importance for industry in general as for the aluminium industry. For both, the respondents allocated high level of importance (>2.5) to the categories of management efforts, human health and safety, product stewardship and as well as emissions to air and waste. The categories child labour, forced labour and disciplinary practices as well as water (with a difference larger than 0.2) were considered by the respondents as less important for the aluminium industry: Relatively more important categories for the aluminium industry seem to be the categories of energy and material use.

The next figure presents a comparison of internal and external stakeholder views on sustainability reporting of the aluminium industry.

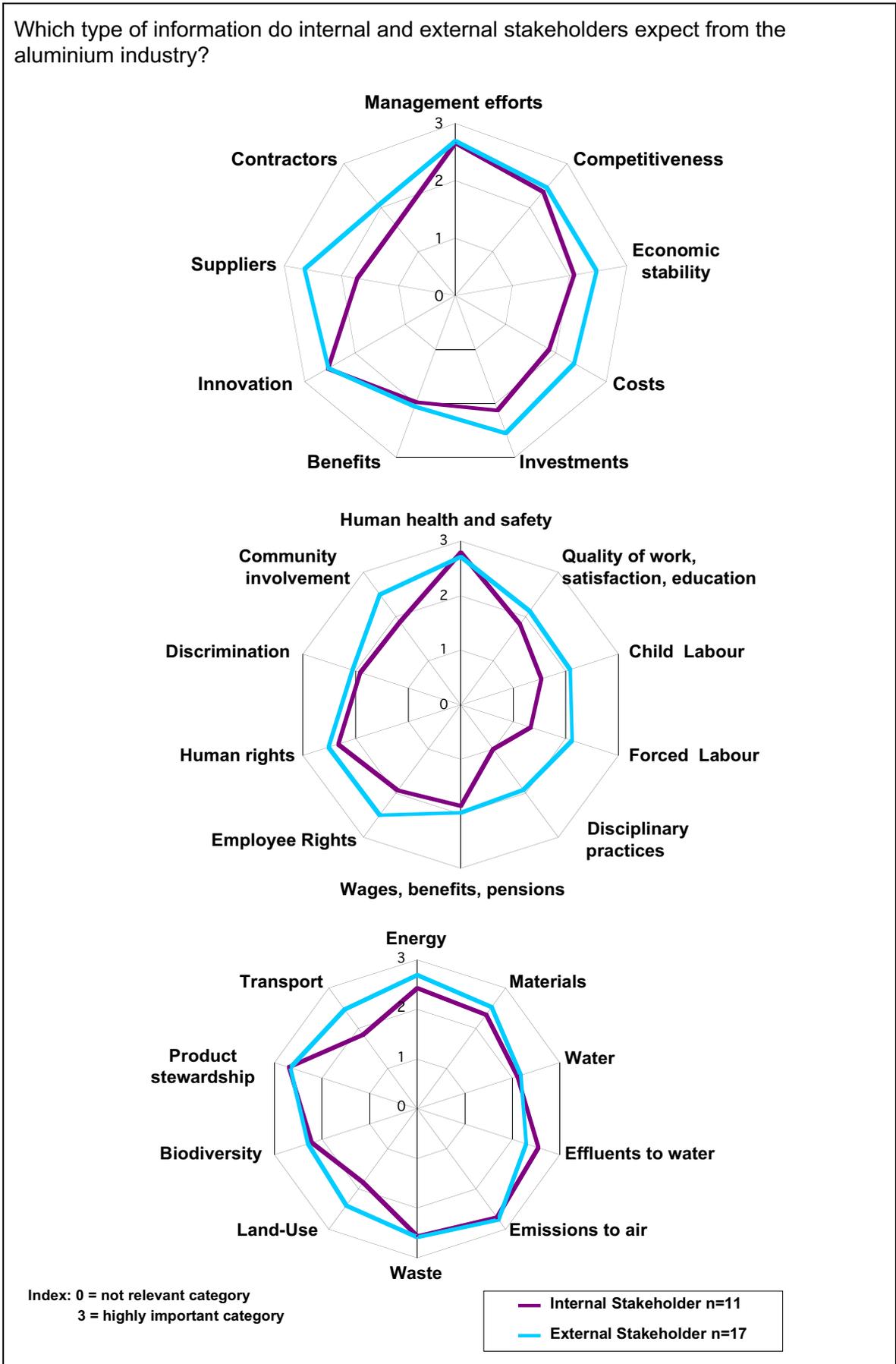


Figure 3.2: Comparison of internal and external stakeholder views on sustainability reporting of the aluminium industry.

In general it can be observed that the external stakeholders assign more importance to most of the sustainability categories than the internal stakeholders do. Major differences (larger than 0.5) can be observed in the categories of suppliers, child and forced labour, disciplinary practices, community involvement, employee rights as well as for land-use and transport.

3.4.3 Importance of different stakeholders

In Part 4 of the questionnaire views on the importance of specific stakeholders were gathered. The results of this part are given in the figure below.

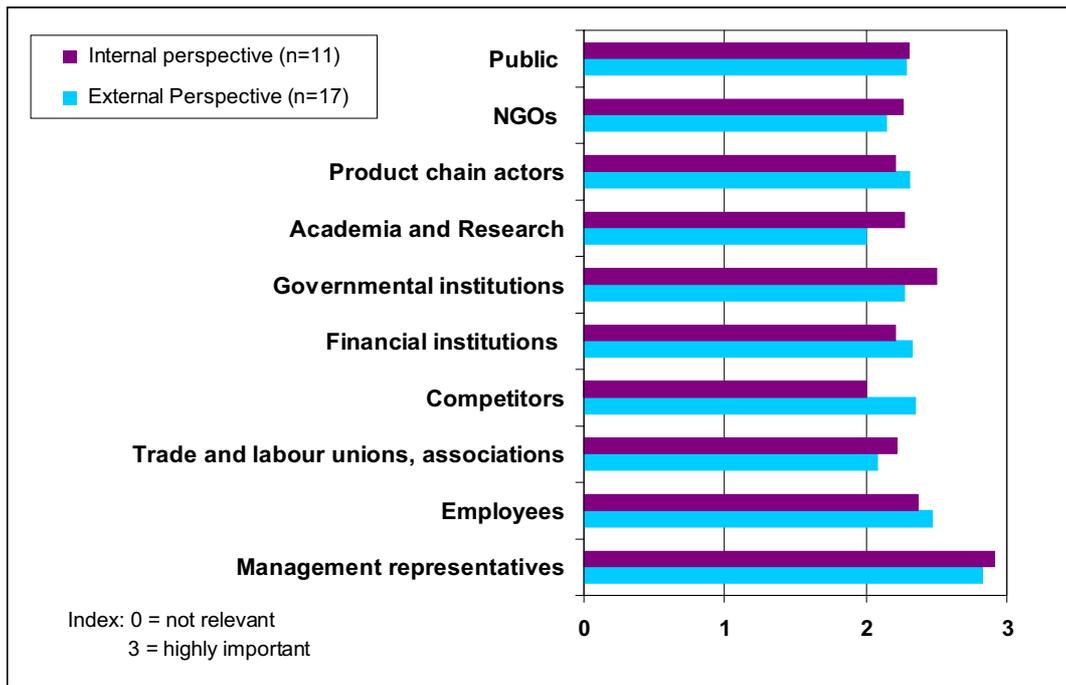


Figure 3.3: Perceived importance of stakeholders for the sustainable development of the aluminium industry

All stakeholder groups were perceived as being important stakeholders for the sustainable development of the aluminium industry. The management representatives are the most important stakeholder group according to the survey. There are just minor differences to be seen between internal and external respondents.

3.4.4 Life cycle aspects of aluminium

Part 5 of the questionnaire focused on the life cycle aspects of aluminium, in particular on the major human needs aluminium satisfies today, today's biggest challenges for the aluminium industry and, further on, the important life cycle aspects. The following figures present the results for each focus area (Figure 3.4).

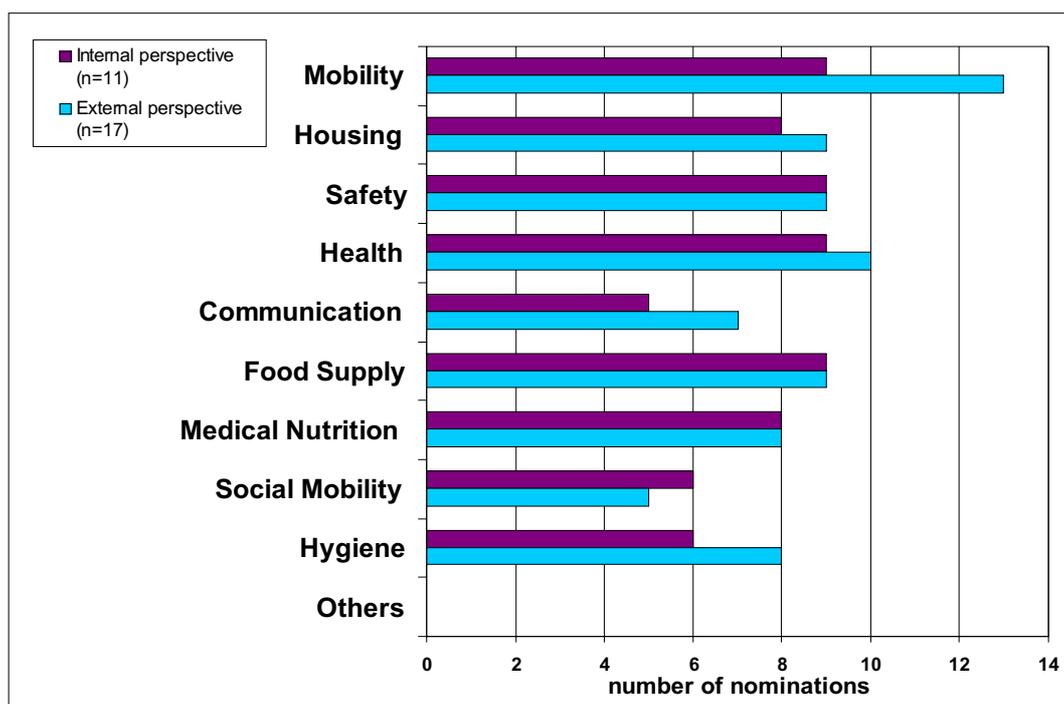


Figure 3.4: Perceived human needs aluminium is satisfying today.

The question about which major human needs aluminium is satisfying was answered through referrals to a variety of aspects. Mobility was the most frequently mentioned human need aluminium is satisfying, whereas communication or social mobility were the options less often chosen. Generally the differences in answers from internal and external stakeholders do not seem to be significant, with mobility being an exception. No additional items other than the suggested ones were mentioned.

Regarding the biggest challenges the aluminium industry is facing on its way towards sustainability (formulated as an open question), the answers are related to the following issues. The number of nominations is given in brackets:

- Climate change and emissions (7x)
- Energy consumption (6x)
- Increase of recycling rate (5x)
- Mining impacts (2x)
- Reduction of resource use (1x)
- Use of expertise in Sustainable Development issues (1x)
- Technology improvements (1x)
- Social instability of losing competitors (1x)
- Communication about Sustainable Development (1x)
- Reduction of water pollution (1x)

The importance of different life cycle aspects was the focus of the last question in part 5 of the questionnaire. The following table presents the four aspects which were perceived as being most important in each life cycle phase.

Table 3.1: Most important aspects perceived in the life cycle phases of aluminium (n=23).

Life cycle phase	Most important aspect
Bauxite mining	• land use after mining
	• image of company/public image
	• protection of eco-system
	• dialogue with community
Alumina production	• image
	• community involvement
	• kind of energy carrier consumed
	• amount of thermal energy consumed
Primary smelting	• CF ₄ , C ₂ F ₆ emissions
	• efficient electricity production
	• CO ₂ emissions
	• amount of electricity consumed
Alumina processing and manufacturing	• product development
	• design for recycling
	• technological development
	• amount of energy consumed
Use phase	• reduced fuel consumption in transport applications
	• reduced emissions due to light weight in transport applications
	• end-of-life value products
	• recycling systems
Recycling	• improvement of recycling
	• improvement of collection system
	• emissions
	• reduced cost through design for recycling
Transport	• competitiveness
	• accident prevention
	• reliability
	• employee training for risk prevention

3.4.5 Comments on the questionnaire

In general, the respondents have given quite positive feedback to the questionnaire in the form of written comments or orally. The survey itself was already a good mean to draw the attention of relevant stakeholders to the entire project. Most of the respondents expressed interest in being involved in activities within the Project "Towards a Sustainable Aluminium Industry".

3.5 Discussion

This section discusses the results of the stakeholder survey in the light of its role within the project.

With respect to which type of information internal and external stakeholders expect from the aluminium industry, the survey observed that there is most consensus on environmental information, whereas there is less consensus on information regarding social and economic issues. This finding can be explained by the fact that environmental information and indicators have been in public discussions and scientific reviews for a long time (over 20 years). In contrast, the setting up of economic and social information/indicators has been less in the stakeholder discussion. This is changing in the current debate. This situation has also been described in the Global Reporting Initiative reporting guidelines, as the following figure illustrates.

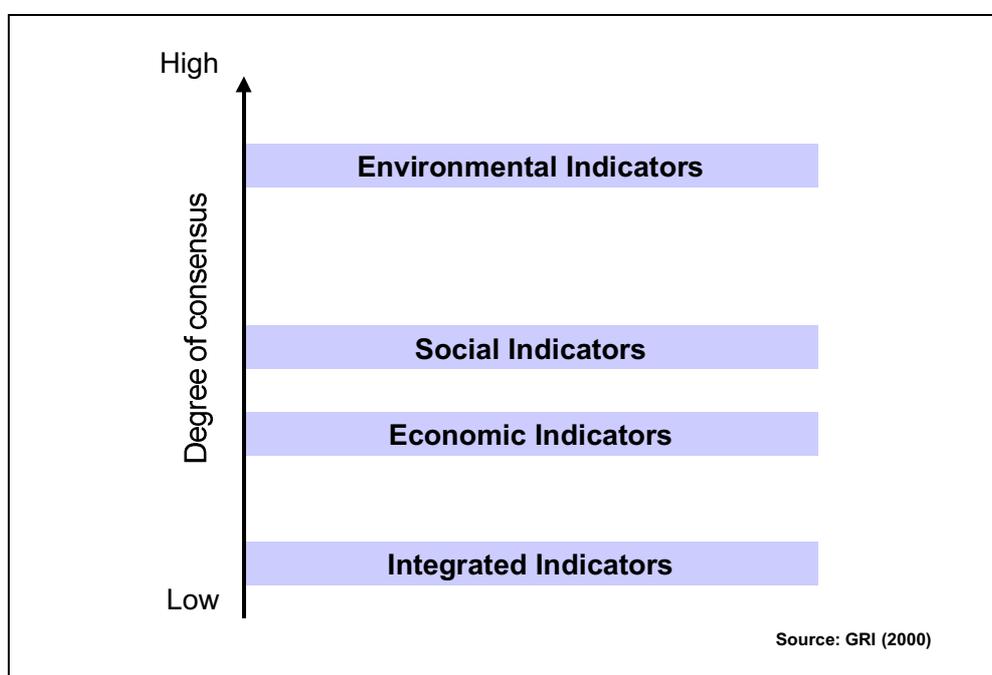


Figure 3.5: Degree of international consensus on sustainability indicators.

With regard to the usability of the questionnaire-based survey as input for development of the indicator set, a significant aspect is the response rate and the distribution of responding stakeholder groups. In comparison to other surveys, the response has been relatively high. The overall goal of a 50% response rate has been reached. However, this response rate was not realised for each stakeholder group, e.g. consumer organisations have not responded. This has to be taken into account when analysing the survey results. In order to cover this gap, further efforts have been taken which aim at identifying the expectations of such groups by analysing the relevant literature.

The list of aspects resulting from the survey results has the character of an initial portrait of opinions. They have been taken as a starting point for further discussions in different workshops with the representatives of the aluminium industry. Furthermore, when combined with the review of opinions and expectations mentioned in different sustainability agendas, they provide input for the description of the categories and aspects in the indicator development process.

4. Designing a first Sustainability Indicator Set for the European Aluminium Industry

This chapter gives an introduction to the status quo of the indicator set development, explains its basic elements, describes the development process conducted in this project, informs about the result and highlights possible ways of operationalising the indicator set.

4.1 Introduction to the indicator set development

The work on suitable indicator sets is not finished yet on any level of socio-economic activity. In fact, there are several initiatives on different levels but most of them with limited scope, e.g. on environmental targets and indicators. The challenge is to develop commonly accepted, internationally harmonised and practicable systems, which enable comparisons between nations, regions and enterprises including targets and indicators also for the economic and social aspects of sustainability. Thus, every actor on the macro, meso and micro level is asked to take an active part in the search and selection process of sustainability indicators.

One of the key challenges of developing indicators is the variety of different business characteristics. While it is tempting to presume that there could be one "universal" set of indicators that would apply to all sectors, in practice it has to be distinguished between core and specific sustainability indicators. Core indicators are generally internationally agreed indicators: they relate to a global sustainability concern or value and they are relevant and meaningful to virtually all businesses. Specific indicators depend upon the specific nature of a business. In order to specify an indicator set for the European aluminium industry it has been important to single out the core economic, social and environmental aspects relevant to the aluminium sector. It has been necessary to analyse the special conditions and structures in the aluminium life cycle and to understand internal and external stakeholder expectations in order to find out core aspects of sustainability in this sector (see chapter 2 and 3).

4.2 Basic elements of indicator set development and its application within this project

In order to build a meaningful indicator set, a systematic procedure for the whole indicator development process is needed. Recognising the importance of such a procedure the International Organisation for Standardisation ISO drew up an international standard, ISO 14031, giving guidance for developing environmental indicators. Based on this standard, further literature and expertise of the Wuppertal Institute, the following elements have been considered within the development process:

- **Framework definition for the underlying concept of sustainability²³:** Different types of frameworks are used to model sustainability as a basis for indicator development, e.g. causal frameworks like the Driving Force-Pressure-Response approach, used by the OECD and the UNCSD, or domain-based frameworks like the Category-Aspect approach

²³ Rennings, Klaus (1994): Indikatoren für eine dauerhafte-umweltgerechte Entwicklung, Münster, p. 130ff.; Birkmann, Jörg et al. (ed.) (1999): Indikatoren für eine nachhaltige Raumplanung. Methoden und Konzepte der Indikatorenforschung, Dortmund, 21ff.; Szerenyi, Tímea (1999a): Zur Operationalisierung von Nachhaltigkeit und nachhaltiger Entwicklung, Köln, S. 43ff.

used by GRI, ISO and the WBCSD²⁴. The second approach has been applied within this project.

- **Scope definition**²⁵: Definition and description of an object for which the indicators are selected, e.g. an enterprise (micro), a sector (meso) or a whole economy (macro). In the course of the project the focus was put on the sector and enterprises belonging to the European Aluminium Industry.
- **Setting system boundaries**²⁶: Decision on whether the indicators should only relate to a single enterprise or whether a system-wide approach should be followed considering the whole value chain. In this project a system-wide approach considering the whole value chain²⁷ has been selected.
- **Choosing an area of application**²⁸: The design of indicators varies according to different areas of indicators' application (see Table 4.3). During the project there was consensus that the developed indicator set may be used for several purposes, e.g. internal and external reporting, controlling and benchmarking within the sector.
- **Decision on stakeholder approach, expert approach or a mixture**²⁹: A stakeholder approach is characterised by actively involving a wide range of stakeholder opinions in indicator selection (e.g. GRI)³⁰. Using an expert approach indicators are selected based on expert views (e.g. UNCSO)³¹. In order to reach a high level of consensus, rather than involvement of a single stakeholder group, utilisation of a multi-stakeholder process, i.e. consideration of a wide range of stakeholder expectations (different professional backgrounds, age, genders, etc.), is important. The number of internal and external stakeholders should be balanced in order to ensure not only external acceptance but also internal use of the indicator set. In the course of the project, a mix of the expert and multi-stakeholder approach has been chosen.
- **Identify relevant sustainability issues**: Relevant sustainability issues depend on the specific context in which the sustainability concept is applied. To identify such issues it is common practice to classify them into dimensions (e.g. environment), categories (e.g. water) and aspects (e.g. effluents to water). A list of identified categories and aspects can be found in the following chapter. Due to the fact that single categories can be relevant to several dimensions (energy is related to both the economic and the environmental

²⁴ Birkmann, Jörg et al. (ed.) (1999): Indikatoren für eine nachhaltige Raumplanung. Methoden und Konzepte der Indikatorenforschung, Dortmund.

²⁵ Kuhndt, Michael/ Liedtke, Christa (1999): Die COMPASS-Methodik, COMPANIES and Sectors path to Sustainability, Wuppertal Papers Nr. 97, Wuppertal Dez. 1999, p. 27f.

²⁶ Kuhndt, Michael/ Liedtke, Christa (1999): Die COMPASS-Methodik, COMPANIES and Sectors path to Sustainability, Wuppertal Papers Nr. 97, Wuppertal Dez. 1999, p. 27f.

²⁷ Today's trend is considering the whole value chain, see: Global Reporting Initiative (2000): Sustainability Reporting Guidelines on Economic, Environmental and Social Performance, Boston June 2000 (considers performance of suppliers and products and services) or WBCSD (1999): Meeting Changing Expectations: Corporate Social Responsibility.

²⁸ Birkmann, Jörg et al. (ed.) (1999): Indikatoren für eine nachhaltige Raumplanung. Methoden und Konzepte der Indikatorenforschung, Dortmund, 58f.; Szerenyi, Timea (1999a): Zur Operationalisierung von Nachhaltigkeit und nachhaltiger Entwicklung, Köln, S. 34f.; European Commission (2001b): Measuring Environmental Performance of Industry (MEPI). Final Report. p.22.

²⁹ European Commission (2001a): Green paper for the integrated product policy, Brussels.

³⁰ Global Reporting Initiative (2000): Sustainability Reporting Guidelines on Economic, Environmental and Social Performance, Boston June 2000.

³¹ UNCSO (ed.) (2001): Indicators of Sustainable Development: Framework and Methodologies. Background Paper No. 3, New York 2001 DESA/DSD/2001/3.

dimension) no explicit distinction between social, economic and environmental dimensions has been made.

- **Defining indicator selection criteria**³²: Selection criteria are tools to evaluate indicators and assure the selection of adequate indicators considering the particular context. Such criteria are, for example, reliability, validity, importance, data availability, cost, etc. The following selection criteria were applied in the project:
 - stakeholder relevance according to stakeholder survey
 - stakeholder relevance according to literature review
 - measurability
 - understandability
 - internal importance
 - external importance
 - comparability
 - existing use
 - level of aggregation (not at all / on process level / on product level / on site level / on company level / on sector level)

The elements listed have been used to develop the indicator set as described in the following chapter.

4.3 The indicator development process used to select indicators for the European Aluminium Industry

The indicator set for the European Aluminium Industry was developed in a 5 step process:

- 1. Identification of relevant categories and aspects by a stakeholder survey (see chapter 3)**
- 2. Identification of relevant categories and aspects through literature surveys and a dialog process.**

Based on a literature/agenda review in chapter 2 and workshop discussions with members from the European Aluminium Industry and the Wuppertal Institute, the categories and aspects identified in step 1 have been reviewed and complemented where necessary. The review aimed at identifying all major sustainability categories and aspects listed and discussed by multiple stakeholders.

The categories identified in steps 1 and 2 are listed in the following table.

³² WBCSD (2000): *Measuring Eco-Efficiency. A Guide to Reporting Company Performance*, p. 11f. Günther, Edeltraud/ Schuh, Heiko (2000): *Definitionen, Konzepte, Kriterien und Indikatoren einer nachhaltigen Entwicklung. Eine Literaturstudie im Auftrag der Degussa-Hüls AG*, in: *Dresdner Beiträge zur Betriebswirtschaftslehre*, Nr. 39/00, Dresden, p. 46f.; Rennings, Klaus (1994): *Indikatoren für eine dauerhafte-umweltgerechte Entwicklung*, Münster, p. 144f.; Birkmann, Jörg et al. (ed.) (1999): *Indikatoren für eine nachhaltige Raumplanung. Methoden und Konzepte der Indikatorenforschung*, Dortmund, 58f.

Table 4.1: List of categories and aspects included

SD categories and affiliated aspects	
1.	Management efforts
1.1	Sustainability policy and strategy
1.2	Corporate economic performance
1.3	Corporate social performance
1.4	Corporate environmental performance
1.5	Stakeholder dialogue on environmental, economic and social performance
1.6	Communication
2.	Costs
2.1	Environmental cost accounting
2.2	Social cost accounting
2.3	External effects
3.	Investments and Innovation
3.1	Investments in R&D
3.2	R&D to improve sustainability performance, Best available technology (BAT)
3.3	Co-operation with science (external)
4.	Economic stability
4.1	Financial performance
4.2	Risk management
5.	Competitiveness
5.1	Long-term profit
5.2	International competitiveness
6.	Human health and safety (H&S)
6.1	Corporate health & safety programmes
6.2	Corporate H&S performance
7.	Wages, benefits, pensions
7.1	Level of wages
7.2	Benefits provided to employees
8.	Quality of work, satisfaction, education
8.1	Quality of management
8.2	Types of work organisation (e.g. teamwork, job rotation)
8.3	Worker participation in decision-making
8.4	Education, qualification, training
9.	Discrimination
10.	Human rights
11.	Employee Rights
12.	Forced Labour
13.	Child Labour
14.	Community involvement
14.1	Efforts to understand community concerns
14.2	Corporate role in the community/region/country
15.	Energy
15.1	Amount of energy consumed
15.2	Energy generation
16.	Water
16.1	Water use
16.2	Effluents to water
16.3	Types of effluents
17.	Air emissions
17.1	Emission types and amounts
18.	Waste
18.1	Amount of waste generated
19.	Material use
20.	Land use
21.	Raw material availability
22.	Suppliers/ Contractors
23.	Product stewardship
23.1	Customers
23.2	Use phase aspects
23.3	After use phase aspects
23.4	Life cycle aspect
24.	Transport

3. Selection of indicators

A first draft of an indicator set was developed by the Wuppertal Institute based on:

- relevant categories and aspects identified
- relevant life cycle aspects mentioned in the survey and
- the review of existing sustainability indicators.

4. Review of selected indicators

The first draft of the indicator set was evaluated by the aluminium industry against the criteria listed in 5.2 “Defining indicator selection criteria”.

5. Drawing up of final draft of the indicator set

Based on the input from step 4, the final draft of the indicator set was drawn up. This version can be discussed in further stakeholder dialogues.

4.4 The outcome: the first indicator set

4.4.1 Composition and reader guide

This section provides guidance on how to look at the indicator set designed to support comprehension and assure adequate interpretation. An extract of the indicator set is shown in Table 4.2. The complete indicator set can be found in the appendix at the end of this report

Scope of the indicator set

The indicators within the set refer to enterprises that belong to the European Aluminium Industry (unless otherwise indicated). In some cases the indicator is linked to the whole product life cycle/value chain, partly also outside Europe (see e.g. categories 22 to 24 and respective interlinkages in the appendix which includes a table of the full indicator set).

Structure

The indicator set is based on categories, aspects and indicators³³:

- **Categories** – i.e. general classing or grouping of issues of concern to stakeholders (e.g. air emissions, energy, community involvement, management efforts).
- **Aspects** – i.e. the general types of information that are related to a specific category (e.g. amount and types of air emissions, amount of energy consumed, efforts to understand community concerns).
- **Indicators** – i.e. the specific measurements of an individual aspect that can be used to track and demonstrate performance. In this regard, a given aspect may have several indicators.

Accordingly, the indicator set consists of two parts (**columns 1 to 2** and **columns 3 to 6**), visualised by the bold borderline between columns 2 and 3.

Information in the **columns 1 to 2** is related to relevant categories (printed bold) and affiliated aspects of sustainable development in the aluminium Industry:

- Column 1 contains all categories and affiliated aspects that were identified as being relevant for the aluminium industry’s path towards sustainability during the project. Additionally, references to the categories and aspects are listed in column 1.

³³ In accordance with Global Reporting Initiative (2000): Sustainability Reporting Guidelines on Economic, Environmental and Social Performance, Boston June 2000 and ISO.

- Column 2 gives information regarding the importance of the identified aspects. In the left part of the column the importance for different stakeholder groups according to a literature review is given. Herein, the following abbreviations are used: Policy (P), Multi-stakeholder (M), Academia (A), Finance (F), Business (B), NGO (N), Standard (S). In the right part of column 2, the average relevance according to the stakeholder survey (scale from low = 1 to high = 3 importance) is given. Only aspects with an average value higher than 2.5 were taken for the set.³⁴

The information in **columns 3 to 6** is related to the selected indicators. Herein, columns 4 to 6 refer to the indicators listed in column 3:

- Column 3 lists the proposed indicators.
- Column 4 highlights sources in which the selected indicator or its underlying idea is referred to.
- Column 5 shows interlinkages between indicators within the indicator set using the number of the respective category/aspect to demonstrate the link. For example: The interlinkages of the indicator 1.4 b “environmental targets set and achieved (description)” mean that the aspects of categories 15 to 23 should be considered in the description of indicator 1.4 b.)
- Column 6 suggests a time frame for each indicator. For multinational companies we suggest the following time: action to be taken in 1 year (short term), 3 years (middle term), 5 years (long term); for small and medium-sized business the time frame might be extended by a factor 2.

A list with the complete bibliography used for the references in columns 1 and 4 can be found below the indicator set at the end of the document.

Unit/Parameters

The parameters for measurement are suggested in brackets at the end of each indicator. In most cases this parameter is self-explaining (e.g. in tonnes). “Description” means that the indicator requires a verbal explanation. This is necessary as the indicator is (not yet) quantifiable or a quantifiable indicator needs further specification of qualitative aspects to provide meaningful information. Information expressed in a ratio form (e.g. percentage) should also be given in an absolute form (for further guidance on ratio indicators see GRI guidelines from June 2000, annex 4).

³⁴ Categories and aspects without such an indication have been selected due to their specific importance identified by the literature review or within the workshops during the project.

Table 4.2: Suggested Indicators for most relevant aspects identified (extract)

1	2	3	4	5	6		
SD categories and affiliated aspects	Stakeholder relevance according to		Suggested Indicators (units/parameters)	The indicator is already standard (S) or listed in . . .	The Indicator is linked to . . .	Priority ² : 1=short- 2=middle 3 =long-term	
	Literature review ¹	Survey					
¹ abbreviations used: Policy (P), Multi-stakeholder (M), Academia (A), Finance (F), Business (B), NGO (N), Standard (S) ² action to be taken in short term, middle term, long term							
1.	Management efforts						
1.1	Sustainability policy and strategy References: - UNCSO (2001) - OECD (2000a), p. 20 - EC (2001) - GRI, p. 26 - WBCSD (2000) - SAM (1998)	P M A F B	2,8	a. existence of publicly available mission and values statement(s), statement of economic, environmental and social policy and other policies with economic, environmental and social provisions (description) b. frequency of review of those statements and policies (e.g. annually) (date) c. consideration of stakeholder opinions in the development of those statements and policies (description) d. number and type of signed sustainability charters and/ or memberships in sustainability councils (e.g. CERES, Global Sullivan Principles, WBCSD etc.) (description)	a. UNCSO (2001), p. 44; GRI, p. 26; SAM (1998), p. 1; PIRC (2000); ING (2001), p. 7 b. GRI; SAM (1998), p.2; PIRC, p. 3; ISO 14031, p. 23; WBCSD (1999); c. SAM (1998), p. 2; Oekom, p. 7; PIRC, p. 4; WBCSD (2000), p. 24 d. GRI, p. 26; SAM (1998), p. 2		1 2 1 1
1.2	Corporate economic performance	S	2,8	a. economic targets set and achieved, e.g. set goals for financial performance indicators (description)		2-5, 22-24	3
1.3	Corporate social performance References: - OECD (2000a), p. 20 - Deutsche Bundesregierung (1997) - EC (2001) - GRI (2000) - SAM (1998) - SAI (1997) - Accountability - WBCSD (2000) - SustainAbility/ UNEP	P M A F B	2,6	a. management levels with specific social responsibilities (description) b. social targets set and achieved (description) c. application of equal social standards worldwide (e.g. H&S, SA 8000, AA 1000) (yes/ no, kind of standards, description) d. social standard certifications (share of sites, share of turnover by site) e. frequency of social auditing or/and reporting by site (date)	a. SAM (1998), p. 1; ISO 14031, p. 22; WBCSD (2000), p. 24 b. SAM (1998), p. 4; ISO 14031 c. Accountability, SustainAbility/ UNEP, Wuppertal Institute d. GRI (2000), p. 26; University of Sussex, p. 27; e. EC (2001), p.16; Oekom (2000), p. 2; ISO 14031, p. 23; WBCSD (1999), p. 8; ING (2001), p. 7	6-14, 22-24 6-14	1 1 2 2 1

4.4.2 How to operationalise / use the indicator set

The benefits of an indicator set arise from its reasonable application and use. This section pinpoints related issues focusing on the interpretation, aggregation and areas of application.

Interpreting the entirety of the indicator set

A key characteristic of indicator sets is their ability to give a condensed picture of a complex reality. In contrast to one-dimensional indicator sets (e.g. Human Development Index, Deutscher Umweltindex or the gross national product) multidimensional indicators sets (e.g. UNCSO) portray a complex reality not by one highly aggregated indicator but by a compilation of several indicators. Multidimensional indicator systems lose their validity if just a subset of the entire set is used without justification. This has some implications for the use of the multidimensional indicator set developed for the aluminium industry in this project:

- The indicator set should be interpreted in its entirety. In order to do so all categories, aspects and indicators (except alternative indicators) should be examined when the indicator system is used. For non-selected categories, aspects and indicators, an explanation should be given, e.g. data are currently not available or the cost for data collection for the indicator is too high.
- To portray the complexity of sustainable development it is crucial to consider the interlinkages within the indicator system. Therefore, the interlinkages highlighted in the indicator set need to be reflected when the indicator system is used. For example human rights issues need to be included in the following categories: corporate social performance; stakeholder dialogue on environmental, economic and social performance, communication; social cost accounting; external effects; suppliers/contractors and life cycle aspects.
- With respect to the data availability and novelty of some indicators, it is reasonable to set a specific timeframe (priority) in which an indicator should be available. The developed indicator set includes suggested timeframes for each indicator (see 4.3.1 “Composition and reader guide”).

Areas of application

Sustainability indicator sets can be used for several purposes both on the micro and meso level. On the sectoral level, areas of application might be

- controlling,
- benchmarking (companies within a sector, same sectors of different countries, sectors with other sectors where possible),
- reporting to internal and external stakeholders (e.g. fulfilment of legal reporting demands) or
- support of internal decision-making.

The following table presents possible corporate decisions where sustainability performance information obtained from an indicator set are useful.

Table 4.3: Corporate decision situations requiring sustainability information, adopted from UNEP (1999)³⁵ and CHAINET (forthcoming)³⁶.

Level of decision	Question type	Examples of decisions where sustainability performance information is helpful
Strategic level	1.Strategic planning	<ul style="list-style-type: none"> Corporate policy development Long-term strategies for technological development Strategies for research and development of a sustainable product portfolio.
	2.Capital investments and acquisition	<ul style="list-style-type: none"> Investments in new technologies or production lines improving the sustainability performance.
Tactical level	3.Design and development (products/ services and processes)	<ul style="list-style-type: none"> Product and service developments at different levels of improvement Process development Technology development
Operational level	4.Communication and marketing	<ul style="list-style-type: none"> Marketing decisions: sustainability information can be used by companies to advertise their products as “more sustainable” or to protect themselves against adverse claims about products by competitors, NGOs and consumers. Product labelling (ISO 14020, Type III) Sustainability reporting for external communication, co-operation and networking
	5.Operational management (including operational purchasing and procurement)	<ul style="list-style-type: none"> Internal monitoring Identify and prioritise management opportunities Compliance with existing or upcoming regulation or initiatives (e.g. IPP) Sustainability management and auditing Product stewardship and chain management Supplier choice, especially relevant in view of issues like e.g. chain liability Benchmarking: companies can compare themselves with each other or may want to monitor their own sustainability performance over time

The value of the indicators used at the micro level increases when this indicator can be related to figures at the meso or macro level. For example, to know that a company produces 10% of the sector’s greenhouse gas emissions or 0.5% of the national emissions is a figure easier to understand than the absolute number in tonnes CO₂ equivalents. In general, benchmarking can be useful for internal and external communication. However, benchmarking needs to be carefully used by firms and their stakeholders. From an operating viewpoint, the use of the sustainability indicators – even at a site level – creates a problem of comparability. To avoid misinterpretations with significant implications on the corporate “green” image, some suggestions have been given by Measuring the Environmental Performance of Industry (MEPI)³⁷. Comparisons should be made where possible between firms:

- producing the same type of products through the same type of production routes;
- having the same level of vertical integration. Otherwise, it may happen that a firm achieves better performance simply because it buys instead of produces a particular component.

³⁵ UNEP (1999). In CHAINET (forthcoming): Guidebook by European Network on Chain Analysis for Environmental Decision Support. Centre for Environmental Science. The Netherlands.

³⁶ CHAINET (forthcoming): Guidebook by European Network on Chain Analysis for Environmental Decision Support. Centre for Environmental Science. The Netherlands.

³⁷ European Commission (2001b): Measuring Environmental Performance of Industry (MEPI). Final Report.

Level of aggregation

Most indicators included in the indicator set are micro-level indicators which apply to the corporate or site level. In order to compile data on a higher corporate or sectoral level, e.g. for a sustainability report of the European Aluminium Industry, the micro-indicators need to be aggregated. Two imported conditions for the aggregation are described in the following figure.

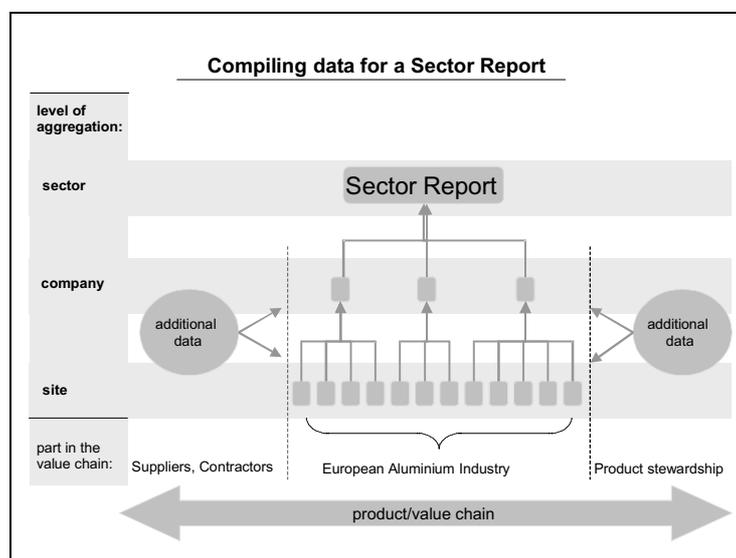


Figure 4.1: Compiling data for a sector report

The aggregation depends on the unit and scale of the indicator within the indicator set: For indicators with an ordinary scale, aggregation can be done simply by summarising micro-data (e.g. the sum of all CO₂ emissions in enterprises belonging to the European Aluminium Industry). Other indicators with nominal scales (e.g. system in place yes/no) can be aggregated by summarising and building ratios (e.g. share of association member companies with full SA 8000 certification). For entirely descriptive indicators (with no quantification) aggregation on meso-level may be difficult. Here specific methods of aggregation need to be searched for. In all cases, the aggregation must be conducted carefully, i.e. potential loss of information should be considered and aggregation should be conducted as transparently as possible.

A precondition for the aggregation of the indicators is the consistency in the data-gathering methodology. This consistency can be achieved by the use of methodological sheets. With the help of these sheets single indicators can be described more comprehensively. This is necessary to provide a uniform and consistent database as bottom line for aggregation and further application of the indicator set. The sheet should cover aspects like:

- indicator description,
- linkages to sustainable development and other indicators,
- methodological description,
- assessment of data,
- agencies involved in the development of the indicator and references.

Exemplary methodological descriptions of two indicators are given in the appendix.

5. Discussion and Outlook

Sustainable development remains a formidable challenge to all actors in society. The European Aluminium Industry addresses this challenge by taking proactive steps towards sustainable development. The key objective of the project “Towards a Sustainable Aluminium Industry: Stakeholder Expectations and Core Indicators” has been the development of a sustainability indicator set tailor-made to the European Aluminium Industry.

The process of developing an indicator set has been effective and addressed major characteristics of sustainable development as mentioned in the following figure.

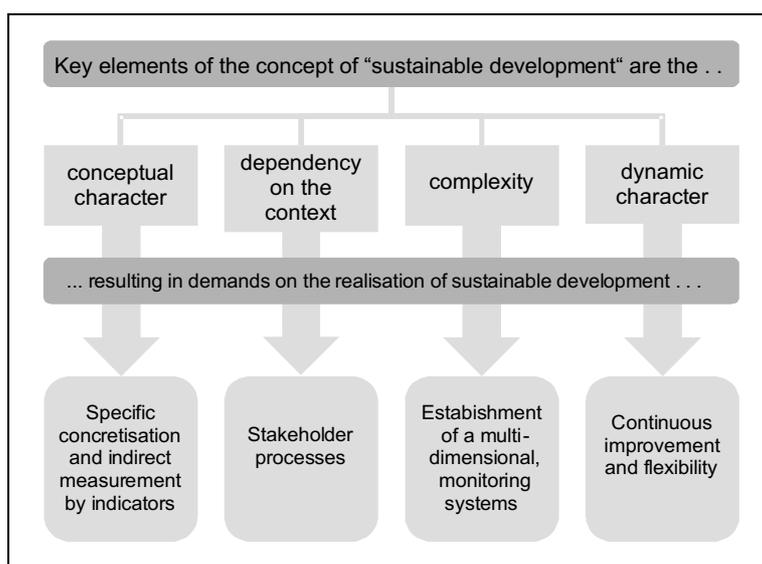


Figure 5.1: Key elements of the concept of sustainable development and resulting demands on its realisation.

To understand the conceptual character of sustainable development it is crucial to get a more tangible view of it. Different sustainability agendas at the regional, national and international levels have been reviewed in the first phase of the project in order to grasp the issues in the current sustainability debate. The review provided valuable inputs to the entire project, e.g. the discussions during the workshops, for the questionnaire as well as for the indicator set development. Chapter 2 describes the selected agendas relevant to the aluminium industry.

What sustainable development means for an organisation depends on the context of the organisation. In that sense, internal and external stakeholders can provide an essential element for “drawing a picture” of the organisational context. The stakeholder survey, as the first step, involved relevant stakeholders of the European aluminium industry in an early stage of indicator development. This involvement of stakeholders follows the trend of recent public initiatives promoting sustainable development, which have drawn on the stakeholder approach as a means of getting a broad consensus among different societal groups on the issues where each initiative is concerned (examples are: the UK Roundtable on Sustainable Development³⁸, the Global Reporting Initiative³⁹, the German Council for Sustainable

³⁸ UK Roundtable on Sustainable Development (2000). Indicators for Sustainable Development. London.

³⁹ Global Reporting Initiative (2000): Sustainability Reporting Guidelines on Economic, Environmental and Social Performance. June 2000, Boston 2000.

Development⁴⁰ and the UN Global Compact⁴¹). The survey and the following analysis provided the aluminium industry with a specific picture of stakeholder expectations and, thus, have been useful to identify relevant categories and aspects for the indicator set. Herein, the survey covered both the broad range of sustainability aspects and life cycle aspects and also identified the top-priority themes like greenhouse gas emissions or energy consumption. The survey and its results are described in chapter 3.

One of the main challenges to the realisation of sustainable development is the interrelation between numerous categories and aspects and further the interrelation between the three dimensions of sustainable development. This complex diversity has, as a first step, been addressed by developing a set of indicators. Within this set a number of interlinkages have been highlighted. Those interlinkages should be considered when using the indicator set (see chapter 4).

Sustainable development relates to an unlimited time horizon and is an on-going dynamic process. The dynamic character of sustainability has been considered in the development of the indicator set considering two issues: Firstly, the project itself has been a dynamic discussion process by the sequence workshops. Secondly, the flexible timeframe, as suggested for the implementation of the indicator set, allows adaptations for a specific organisational context (see chapter 4). Over time single aspects might be added if the stakeholders demand information on additional issues. Experience from the historical developments in environmental reporting shows that more aspects tend to be added rather than being dropped.

In summary, this project aimed at methodological novelty due to its sectoral approach and shows an proactive approach taken by the European aluminium industry. Methodologically, an objective was to demonstrate the practical consideration of a number of sustainability agendas and stakeholder expectations that have been developed/mentioned by the major relevant stakeholders, e.g. governmental bodies, financial institutions, NGOs, academic researchers, standards organisations and industry associations. Hereby, the objective has been to identify categories and aspects for an indicator framework that could give a reliable, complete and transparent measure of a sectors' sustainability performance. In order to harmonise the measurement of this indicator set, data sheets, considering international and national measurement approaches, have to be developed as the next step. The collected information could then be presented in a sectoral sustainability report. As highlighted above, the developed indicator set depends on the context (the context within the project has been based on mainly the views of European stakeholders) and has a dynamic character. It is suggested to express the continuous character of the stakeholder process in the form of further consultations. This approach allows the participating stakeholders to see the effects of their input and the authenticity of the stakeholder consultations by the aluminium industry. Furthermore, in order to support the continuous use and development of the indicator set, a management structure and an interdisciplinary sustainability team that supports decision-making towards sustainability might be set up on a sectoral and company level. Such a structure and team can also help to develop sector-wide sustainability visions and targets. With these visions and targets, the sustainability indicator set can be built into a long-term framework.

⁴⁰ German Council for Sustainable Development (2001). Available: www.dialog-nachhaltigkeit.de.

⁴¹ UN Global Compact (2000) Available: www.unglobalcompact.org

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7. References

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Appendix

The appendix is confidential.