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Sustainable development indicators of the European aluminium industry

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Abstract

The European aluminium industry, through its member organisation the European Aluminium Association (EAA), initiated a program on sustainable development for the aluminium industry in 2001. The first step involved the development of a set of sustainable development (SD) indicators for the industry which was developed during 2001 and 2002 with both internal and external stakeholder groups. A list of 34 indicators was used in the first survey exercise. The survey attempted to cover all European plants producing alumina, primary aluminium, rolling ingots, extrusion ingots, foil and recycled aluminium; this covered approximately 800 plants. The survey used two points in time, 1997 and 2002, in order to start developing a trend for the individual indicators and to measure progress over time. The industry response to the survey was very positive, with a total industry coverage based on tonnage reported of over 80% for 2002 data and 70% for 1997 data. The EAA is committed to conducting this as a regular exercise and is engaged in a number of stakeholder workshops in order to present the survey results, to review the indicators used and to also consider adjustments of these based on feedback from stakeholders and experiences from the first data collection.

Keywords: Sustainable development; Aluminium industry; Environmental protection

1. Introduction

In 2001, the European aluminium industry, represented by the European Aluminium Association through its Executive Committee and General Assembly, embarked on a sustainable development programme for the companies active on the European market. One of the reasons for embarking on such an initiative was to demonstrate that the challenges presented to companies on their social and environmental impacts are clearly signalling an era of heightened accountability. The aim was to address the issues in an open, inclusive and pro-active, responsible way in order to align the industry with twenty-first century standards of corporate governance. Moreover, this signalled a shift from passive to active responsibility.

As a starting point, it was necessary to start educating the whole industry about the principles of sustainability. This was followed by an exercise where we examined the soft conceptual issues in order to convert them into hard tangible concepts applicable to the industry. This was necessary in order to translate these concepts both internally for reporting purposes and to external stakeholders. The natural means for an industry organisation to achieve this goal was to examine the reporting from its members according to an agreed format with well-defined parameters. This format was used as basis both for benchmarking within the industry and external reporting. The challenge was how to turn the sustainability principle into a reportable set of parameters. The industry developed a mission statement as follows: meeting the needs of the present, without compromising the ability of future generations to meet their own needs. This is based on the traditional Brundtland definition which states that ‘‘sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs [1].

For the aluminium industry this concept can be understood as follows:

- Meeting the needs of modern society and creating value by offering aluminium products with unique properties;
- Creating the opportunity to reduce environmental impact through the use of aluminium products; at the same time

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reducing the environmental impact of our production processes and of our products throughout their life-cycle;
- Showing our social responsibilities towards employees, customers, suppliers, local communities and society in general;
- Achieving continuous progress through the sharing of best practices and regular indicator-based reporting;
- Encouraging member companies to work along the lines of international conventions like the UN Global Compact.

As further stated in the Brundtland Commission, ''the goals of economic and social development must be defined in terms of sustainability in all countries'' [1]. For the aluminium industry, the essential element was to ensure tangible and concrete examples of sustainable development. The fluid nature of the sustainable development concept makes it increasingly difficult to distinguish between ''true'' sustainability initiatives [2]. Therefore the indicators had to be based on the Global Reporting Initiative (GRI)—an independent organisation that develops sustainability reporting guidelines. The aim was to base the EAA SDI on these guidelines in order to derive at indicators which can be measured over time and be built into a dynamic process.

2. Developing the indicator set

The indicator set which was commissioned to two external institutes where we listed a number of key initial requirements for our ''Aluminium SDI'' which included:

- not more than 30 indicators in total;
- well-balanced between environmental, social and economic parameters;
- relevant for the aluminium industry;
- relevant for external stakeholders;
- quantitatively measurable and/or qualitatively descriptive;
- possible to aggregate at the European level;
- data available or possible to generate.

The Wuppertal Institute (WI) was commissioned to assist in developing an indicator set based on their experience, proven methodology and numerous contacts with different institutions engaged in sustainability projects. WI's working method was a top-down approach where they examined existing indicator sets from different institutions. Drawing from their own expertise and an extensive stakeholder survey, WI drew an initial list of approximately 150 indicators which could be relevant for our purpose. As a follow-up, WI arranged two stakeholder workshops with participation from industry, authorities, academia, environmental and social NGOs in order to validate the selection and to get a feedback from external stakeholders as regards their expectations vis-à-vis reporting from the aluminium industry. As well, the initial list of 150 indicators was unworkable and had to therefore, be reduced to a manageable amount.

WI noted that the aluminium industry regards sustainable development ''as an ongoing search process -with components derived from the past, present and future'' [3]. This commitment is enshrined in a process which is designed to realize a number of activities, such as reduction of greenhouse gas emissions, community dialogue initiatives, etc. This is due to many factors, including increased visibility and expectation of our growing industry vis-à-vis customers, consumers, employees and regulators.

The second institute, Versailles University, was commissioned to conduct surveys at the plant level where a team of academics met with different employee groups, local authorities, suppliers and customers, in a bottom-up exercise to develop mainly the social indicators since it was recognised that these were the least developed on an international level. The exercise was started with three different plants in France, representing both different types of aluminium plants and also different geographical areas. The project was later followed-up with a similar process at plants in Germany, Italy and UK in order to ensure a broad geographical and social diversity. This resulted in a list of approximately 50 social indicators and 50 economic indicators.

In order to properly weigh the indicators, the EAA established an internal sustainable development expert group in order to select the indicator set (Table 1) for our first survey.

3. Conducting a SD survey

In order to conceptualize the selected indicators, the EAA aimed to retrieve individual survey data from each plant and not company aggregated data. The goal was to cover the alumina plants, primary smelters, rolling mills, extrusion plants, foil plants and recycling plants in Europe, defined as Western Europe and the new accession countries. This totalled approximately 750 individual plants to be surveyed. Approximately 1800 casting plants were excluded as they are not EAA members and therefore we do not have direct contacts with these various plants. Downstream fabrication plants were also excluded for the same reason.

The mix of plants surveyed was as follows: (1) small, single company plants, (2) large, integrated companies with operations in several countries and (3) several variations in between. In addition some of our national associations were also interested in producing country specific reports. This made it necessary to have several target groups in order to maximise coverage.

A major part of the work involved validating of data received. In order to fulfil this task, it was important to ensure the necessary correction of data points with the relevant plants and follow-up on unfilled or missing survey reports. Once this task was completed, the data had to be aggregated which also required statistical treatment. As expected, the response rate varied considerably depending on the indicator because of the data availability for smaller companies and problems in separating individual plant or country data for some of the large integrated companies. The challenge for the plants was to produce data for two points in time, 1997 and 2002, which required them to retrieve information from their old files in order to correctly respond to the survey. The basis for the

Table 1
EAA list of sustainable development indicators: structure and grouping of indicators

1. Policy and management efforts
1.1. EAA sustainability mission statement
1.2. Plant certification
2. Production
2.1. Total production
3. Competitiveness.
3.1. Aluminium use per capita
3.2. R&D expenditure and personnel
3.3. Value added
4. Revenues and payment
4.1. Total revenue
4.2. Taxes paid
5. Employee conditions and relations
5.1. Training performance
5.2. Wage levels
5.3. Total number of employees
6. Community relationship
6.1. Community expenditure
6.2. Community dialogues
6.3. Community health initiatives
7. Health and safety
7.1. Total recordable incident rate
7.2. Lost time incident rate
7.3. Fatalities
7.4. Severity rate
7.5. Employee exposure assessment
7.6. Employee health assessment
8. Resource use global
8.1. Bauxite availability
8.2. Mine rehabilitation
9. Resource use – European
9.1. Energy consumption
9.2. Renewable energy
9.3. Fresh water consumption
10. Emissions
10.1. Water effluent
10.2. Climate gases emissions
10.3. Fluoride emissions
10.4. BaP emissions
10.5. Bauxite residue deposited
10.6. SPL deposited
11. Product life cycle
11.1. Use phase
11.2. End of life phase
11.3. Life cycle aspects

methodology used was the GRI guidelines. Whilst the guidelines do not provide a standard for environmental disclosure, they do provide generally applicable indicators such as energy (joules) and materials (tonnes or kilograms) in order to derive at comparable and verifiable data. The guidelines also refer to qualitative characteristics for reports [4].

For internal benchmarking purposes the data was aggregated into sector results and for external communication the sectors were grouped together in two major areas: (1) ''metal production'', which included alumina, primary smelters and recycling plants and (2) ''semi-fabrications'', which included rolling, foil plants and extrusion.

In general, the response rate was very good and, as expected, it was considerably lower for 1997 as compared to the 2002 data. For certain sectors we had reports from around 90% of the total production, and for the 2002 data the response rate was close to or above 50% of production in all sectors. In certain cases low response rates for individual indicators made it necessary to exclude these from the final report. External industry experts who were not involved in this exercise validated the final sector results in order to ensure consistency and transparency.

4. Survey results

The results from the survey are given in Table 2 where all the aggregated figures are listed. The economic data were scaled-up to represent the total industry using the response figures given. Some of the social data, such as training hours and wage levels, have been averaged based on the number of employees.

The results demonstrate good progress in nearly all areas. The economic performance for the industry as a whole is solid; the environmental and social data demonstrate a responsible industry with an excellent track record. However, this also demonstrates development over time and does not indicate recent and upcoming trends and issues. This is a crucial trend for our member companies to sharpen their competitiveness in a globalising world. As a result, this made it necessary for EAA to develop a separate competitiveness report focusing on the situation for the primary smelters in Europe and the impact of increasing electricity prices and the future implications this is having for our industry.

As Holgaard and Jorgensen noted, there are several reasons why companies and, in this case, an association publish environmental or SDI reports [5]. For the EAA, this exercise went beyond environmental liability issues to include the following reasons:

- Drive environmental improvement;
- Can answer demands from environmentalists, authorities, shareholders, employees or customers to report on specific environmental issues;
- Can serve to visualise an image of the aluminium industry as having an obligation to account for its impacts towards stakeholders;
- Differentiates the aluminium industry from competitors;
- SDIs are a key ingredients to building, sustaining and continually refining stakeholder engagement and creating a positive image for our sector;
- Transparency and open dialogue about performance, priorities and future plans helps to strengthen partnerships and to build trust [5].

Finally, it is important to note that the Maastricht Treaty amended Article 2 to include as one of the Community's task the promotion of 'sustainable and non-inflationary growth respecting the environment'. Article B of the Treaty similarly refers to 'economic and social progress which is balanced and sustainable'. As such, Article 2 places environmental protection on an equal footing with economic concerns as one of the Community's objectives. The EAA response to this new direction is demonstrably through its indicators and the dynamic SDI process.

Table 2
Survey results for the European Aluminium Industry sustainable development indicators

DATA		2.1 Production		1.2 Plant certification			3.1 Aluminium use per capita		3.2 R&D Exp.		3.2 R&D Persons employed		3.3 Value added		4.1 Revenue	
		KTonnes	%resp.	ISO	OSHA	%resp.	kg		In M€	%resp.	Persons	%resp.	In M€	%resp.	In M€	%resp.
Metal Prod + Alumina	1997	13.672	75.4	14.5	3.6	75.4	n.r.	n.r.	26.5	23.9	148	29.7	2.328	26.2	12.095	39.3
	2002	15.819	85.2	60.0	5.0	85.2	n.r.	n.r.	101.5	82.3	595	79.4	3.510	73.7	15.097	74.0
Semi-Fabr + Foil	1997	6.479	54.0	14.3	0.0	54.0	n.r.	n.r.	121.6	22.5	559	24.0	5.352	27.5	18.485	34.6
	2002	7.361	67.9	62.1	6.3	67.9	n.r.	n.r.	170.1	60.6	1.073	54.8	5.895	56.8	22.051	64.7
Aluminium industry	1997	20.151	68.5	14.4	1.6	68.5	16.9	n.r.	148.1	22.8	708	25.2	7.680	27.1	30.580	36.4
	2002	23.180	79.7	61.3	5.8	79.7	18.9	n.r.	271.5	68.7	1.668	63.6	9.405	63.1	37.148	68.4

Europe defined as EC25 countries. EFTA & Turkey
Metal production includes alumina. primary smelting. refining and some remelting.
Some remelters data are included in the figures for semi-fabrication.
Semi-fabrication includes rolling. extrusion and foil production.

DATA		2.1 Production		4.2 Taxes		5.1 Training hours per year/person		5.2 Wage level % of average		5.3 Employees		6.1 Communitry expenses		6.2 Community dialogue	
		KTonnes	%resp.	In M€	%resp.	Hours	%resp.	%	%resp.	Number	%resp.	In M€	%resp.	%penetr.	%resp.
Metal Prod + Alumina	1997	13.672	75.4	288.5	36.9	19.7	34.2	107.6	22.9	31.754	71.6	14.5	34.6	25.5	75.4
	2002	15.819	85.2	407.5	49.7	36.4	75.8	112.7	28.7	32.975	83.5	34.6	56.6	51.7	85.2
Semi-Fabr + Foil	1997	6.479	54.0	191.5	30.1	14.6	41.5	107.2	21.5	64.901	45.3	13.0	20.8	27.1	54.0
	2002	7.361	67.9	213.2	42.9	20.2	59.2	109.3	47.0	72.889	57.3	14.5	46.0	44.2	67.9
Aluminium industry	1997	20151	68.5	480.0	34.2	16.4	38.9	107.3	22.0	96.655	53.9	27.5	28.1	26.4	68.5
	2002	23180	79.7	620.7	47.3	26.0	65.1	110.1	42.2	105.863	65.5	49.1	53.5	47.1	79.7

DATA		2.1 Production		6.3 Comm health initiative		7.1 Accidents LTI (Lost Time Incid.)		7.2 Accidents TRI (Total Record Inc.)		7.4 Accidents severity		7.5 Empl exposure assessment		7.6 Empl health assessment	
		KTonnes	%resp.	%penetr.	%resp.	(*)	%resp.	(*)	%resp.	(**)	%resp.	%penetr.	%resp.	%penetr.	%resp.
Metal Prod + Alumina	1997	13.672	75.4	20.0	75.4	11.7	l.d.	33.4	l.d.	290	l.d.	52.7	75.4	54.5	75.4
	2002	15.819	85.2	30.0	85.2	12.4	88.1	27.4	88.1	259.3	88.1	90.0	85.2	88.3	85.2
Semi-Fabr + Foil	1997	6.479	54.0	27.1	54.0	18.3	l.d.	34.1	l.d.	319	l.d.	74.3	54.0	71.4	54.0
	2002	7.361	67.9	38.9	38.9	10.7	65	20.3	65	281.6	65	89.5	89.5	87.4	87.4
Aluminium industry	1997	20.151	68.5	24.0	68.5	15.4	l.d.	33.8	l.d.	306.5	l.d.	64.8	68.5	64.0	68.5
	2002	23.180	79.7	35.5	79.7	11.3	79.9	22.7	79.9	273.9	79.9	89.7	79.7	87.7	79.7

(*) Number of accidents / million hours worked (**) # days lost / million h. worked

DATA		8.1 Bauxite availability		8.2 Mine rehabilitation rate		8.2 Plants with re-habilitation progr.	
		years		%	% resp	%	% resp
Bauxite / Alumina Ind	1997	400		79	73	88	73
	2002	400		83	71	97	71

DATA		2.1 Production		9.1 Electric energy consumption / t.		9.1 Other energy consumption / t.		9.2 Renewable electric energy %		9.3 Fresh Water consumption / t.		10.2 Climate Gas emissions / t.	
		KTonnes	%resp.	kWh	%resp.	Mjoule	%resp.	%	%resp.	m^3	%resp.	$kgCO^2eq/t$	%resp.
Metal Production	1997	7.732	75.5	7.658.7	75.5	19.250.2	75.5	40.3	75.5	27.8	75.5	2.481.8	75.5
	2002	9.386	87.6	7.361.4	85.1	16.927.9	85.5	44.7	85.1	12.5	82.6	1.898.6	87.2
Semi-Fabrication	1997	5.792	54.9	974.6	54.9	3.104.3	54.9	17.5	54.9	10.1	54.9	174.7	54.9
	2002	6.607	67.8	773.3	66.5	2.718.2	66.5	17.5	66.5	6.7	62.4	158.9	67.2
Aluminium industry	1997	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
	2002	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.

Europe defined as EC25 countries. EFTA & Turkey.
Metal production indicates the consumption or emission (alumina. primary and recycled) per tonne aluminium metal (primary and recycled) produced in Europe.
Semi-fabrication indicates the consumption or emission (rolling. extrusion and foil) per tonne semi-fabricated product (rolling and extrusion) produced in Europe.
n.a. = not available n.r. = not relevant

Table 2 (*Continued*)

DATA		2.1 Production		10.3 Fluoride emissions / t.		10.4 BAP emissions / t.		10.5 Bauxite residues / t.		10.6 Spent Pot Line deposit / t.	
		KTonnes	%resp.	kg/t.	%resp.	g/tonne	%resp.	kg/tonne	%resp.	kg/tonne	%resp.
Alumina Production	1997	5.940	91.1	n.r.	n.r.	n.r.	n.r.	673	91.1	n.r.	n.r.
	2002	6.433	93.5	n.r.	n.r.	n.r.	n.r.	713	93.5	n.r.	n.r.
Primary Production	1997	3.631	89	1.24	89	3.2	89	n.r.	n.r.	22.9	89
	2002	4.302	96.1	0.98	96.1	1.44	94.2	n.r.	n.r.	19.8	96.1
Aluminium industry	1997	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
	2002	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.

Europe defined as EC25 countries. EFTA & Turkey
Bauxite residue relates only to alumina produced in Europe.
Fluoride and BAP emissions. and spent pot line deposits relate to aluminium production in Europe
n.a. = not available n.r. = not relevant

DATA		11.1 Aluminium use cars		11.1 Aluminium use cans		11.2 Aluminium use buildings		11.2 Al recycling rates - automotive		11.2 Al recycling rates - building		11.2 Al recycling rates - cans	
		kg/vehicle		Market share%		million tonnes		%		%		%	
Aluminium industry	1997	85		45		1.629						40	
	2002	117		50		2.11		95		95		46	

5. Concluding remarks

This exercise demonstrated that the aluminium industry is committed to the concept of sustainable development and is prepared to demonstrate to stakeholders how the industry is progressing based on a set of indicators relevant for the industry.

With the experience gained from the results of our first survey and the recent round of stakeholder workshops we are now in the process of refining our indicator set in order to fulfil the following recommendations: eliminate certain indicators deemed to be less relevant and difficult to answer, and to include certain indicators agreed during the stakeholder's discussion where some felt it important for us to address.

The current plan is to conduct new industry surveys every three years; therefore, the next phase will commence in 2006 and will use industry data from 2005.

The benefits of pursuing this sustainable development exercise are both tangible and intangible. It can lead to unanticipated regulatory benefits as well as create a benchmark for member companies. It does involve thinking 'outside the box' which has created cohesion among member companies. As stated previously, there has been a large interest from customers, regulators and NGOs, but also from other industrial sectors that have shown a keen interest to develop similar initiatives.

Overall, the SDI exercise "helps sharpen management's ability to assess the association's contribution to natural, human, and social capital. This assessment enlarges the perspective provided by conventional financial accounts to create a more complete picture of long-term prospects" [4].

Finally, the European aluminium industry's intention is to ensure this remains a dynamic and continuous process, and that the sustainability surveys are the basis for a continued stakeholder dialogue. One of the challenges for the individual plants is to integrate sustainable development into the continuous improvement of their business processes. The next SDI phase will incorporate competitive indicators and examine options for third-party verification of the data in order to reinforce their relevance, completeness, neutrality and comparability.

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