International Aluminium Institute

Aluminium for Future Generations/2007 update

The *Aluminium for Future Generations* initiative is a programme of continuous improvement on the part of the global aluminium industry, overseen by the *International Aluminium Institute* (IAI). It comprises voluntary objectives, related to all key phases of aluminium's life cycle and covering the sector's social, economic and environmental performance. There are currently thirteen voluntary objectives, agreed by the IAI's Board of Directors – chief executives of the Institute's twenty six member companies – and the number is increasing year by year. The industry's performance towards meeting these objectives is measured annually against twenty two performance indicators.

This update reports on the survey results for 2006 performance of IAI member companies, which are collectively responsible for over 70% of global primary aluminium production and around 20% of recycled metal production. For further information on IAI members and activities visit www.world-aluminium.org.

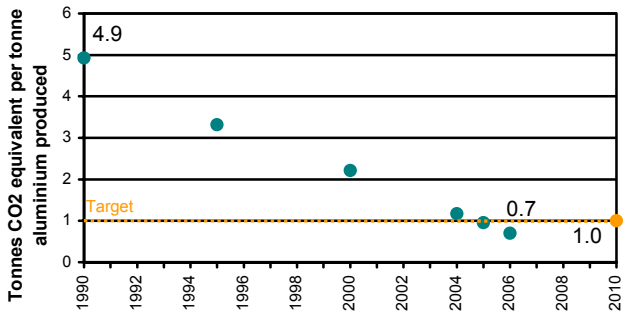
The 2007 survey update collected 2006 performance data from:

- 110 smelters producing approximately 22 million tonnes of primary aluminium equivalent to 65% of total global production;
- 37 refineries producing over 46 million tonnes of smelter grade alumina, equivalent to around 70% of total global production;
- 11 mines representing producing over 81 million tonnes of bauxite, equivalent to around 50% of total global bauxite production.

Overarching Objective
The industry aims to increase continuously its participation in the IAI's global surveys.

2006 Sustainability Performance

Voluntary Objective 1
An 80% reduction in perfluorocarbon (PFC) greenhouse gas emissions per tonne of aluminium produced for the industry as a whole by 2010 versus 1990 levels.



***NOTE**: CO_2 equivalents of calculated PFC emissions for 1990 to 2006 have been revised this year to reflect latest Tier 2 coefficients from the 2006 Intergovernmental Panel on Climate Change (IPPC) Guidelines for National Greenhouse Gas Inventories.*

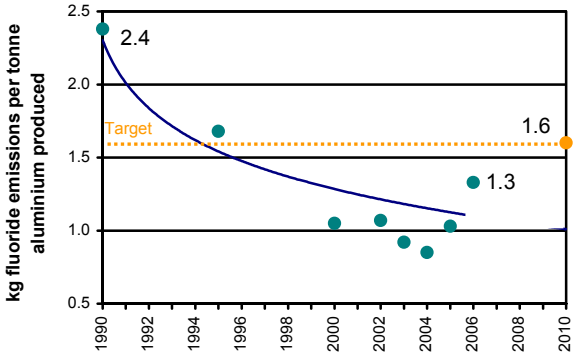
The 2010 voluntary objective was met and exceeded in 2006, with PFC emissions from the global aluminium industry reduced by 86% per tonne of aluminium produced between 1990 and 2006. Total aluminium PFC emissions to the atmosphere were reduced by over 61% between 1990 and 2006, even though total primary production increased by almost 80% from 19 to 34 million tonnes over the same period.

Current global PFC emissions performance is equivalent to a reduction of over 4 tonnes of CO_2 per tonne of aluminium produced since 1990.

PFCs are potent greenhouse gases with long atmospheric lifetimes, formed in the aluminium smelting process during brief upset conditions known as 'anode effects'. The improvement in PFC emissions performance over the last fifteen years is in part due to a heightened awareness at all levels within companies and the availability of facility benchmarking data and sharing of best practices to reduce the frequency of anode effects.

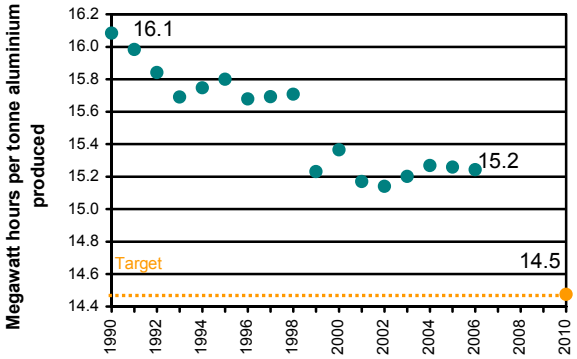
There is still a considerable range of anode effect performance between facilities, indicating that there is still an excellent opportunity for further reducing anode effects and resulting PFC emissions. Now that the 2010 voluntary objective has been met the industry looks forward to setting a new PFC emissions reduction voluntary objective.

Voluntary Objective 2
A minimum 33% reduction in fluoride emissions by IAI member companies per tonne of aluminium produced by 2010 versus 1990.



Total fluoride emissions (gaseous and particulate) were reduced by over 40% per tonne of aluminium produced between 1990 and 2006, exceeding the 2010 voluntary objective. The increase since 2004 is due to increased survey participation.

Voluntary Objective 3
A 10% reduction in smelter electrical energy usage by IAI member and reporting companies per tonne of aluminium produced by 2010 versus 1990.

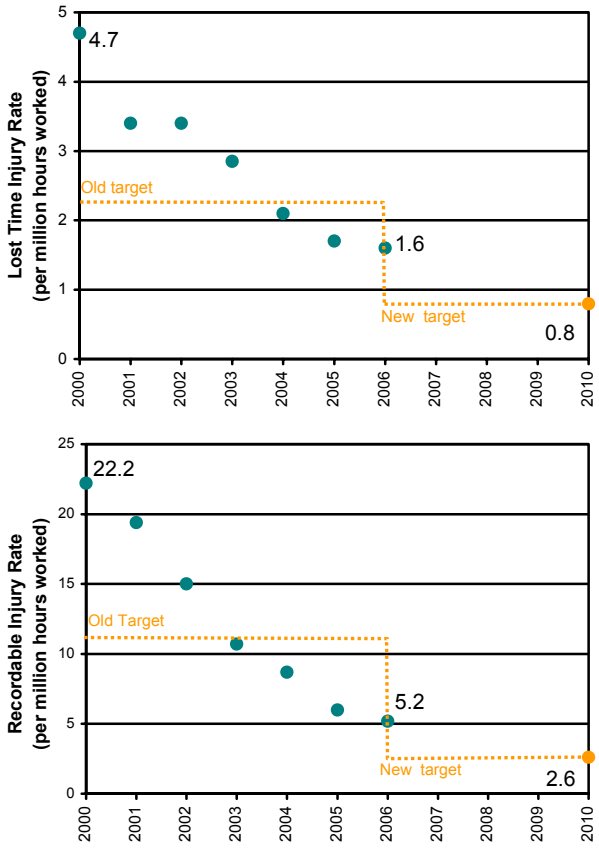


The average electrical energy required by the smelting process to produce one tonne of aluminium from alumina was cut by 6% between 1990 and 2006, mainly through investment in new production capacity. New smelters generally utilise best available technologies no matter where in the world they are located and the IAI is helping producers to share knowledge and best practice to improve energy efficiency.

Voluntary Objective 4
New Objective: A 50% reduction in the lost time injury frequency rate and total recordable injury frequency rate by 2010 versus 2006 by IAI member and reporting companies.
Old Objective: A 50% reduction in the lost time injury frequency rate and total recordable injury frequency rate by 2010 versus 2000 by IAI member companies.

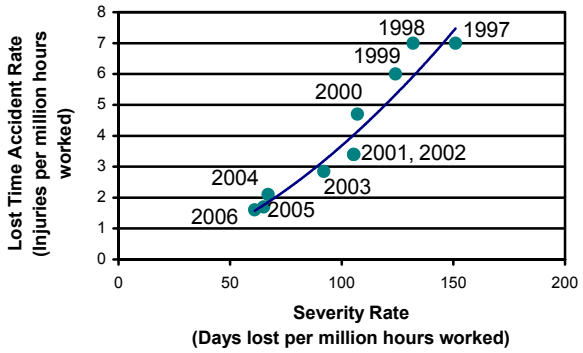
Safety performance data is collected in a survey with a wider reporting base than IAI membership. The survey was initiated in 1997, with a coverage of 107 million working hours. By 2002 the number of working hours surveyed had risen to 315 million and by 2006 to 418 million. The survey now covers 102 aluminium smelters, 35 alumina refineries and 18 bauxite mines.

The old objective was reached in 2003 and 2004 respectively. In light of this achievement a new target was developed in 2006.



The total recordable injury frequency rate was cut by 77% between 2000 and 2006. The lost time injury frequency rate was reduced by 66% over the

same period. A focus on improving injury rates has also seen the number of days lost per injury (the severity rate) decrease by 60% between 1997 and 2006.



Improvement in the industry's injury rates is being driven by factors including increased top management attention and commitment to safety, a more systematic approach to the analysis and follow up of accidents and higher levels of involvement of the workforce, as well as mechanization and automation as a means of reducing hazards and safety risks.

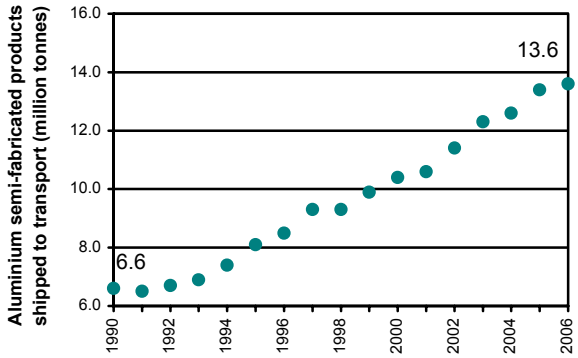
Voluntary Objective 5
Implementation of Management Systems for Environment (including ISO 14000 or equivalent certification) and/or Health and Safety in 95% of IAI member companies' plants by 2010.

In 2006 the industry continued towards achievement of this objective, with 90% of plants having EHS management systems in place. Of the surveyed facilities 89% had achieved ISO 14000 certification, while 39% were OHSAS 18000 certified.

Voluntary Objective 6
Implementation of an Employee Exposure Assessment and Medical Surveillance Programme in 95% of IAI member companies' plants by 2010.

In 2006, 93% of the plants had employee exposure assessment and medical surveillance programmes in place, as defined in IAI published guidelines.

Voluntary Objective 7
The industry will monitor annually aluminium semis shipments for use in transport in order to track aluminium's contribution through light-weighting to reducing greenhouse gas (GHG) emissions from road, rail, air and sea transport.



Aluminium semi-fabricated products shipped to the transport sector increased by approximately 28% in the five years from 2001. Global greenhouse gas savings from the use of aluminium for lightweighting vehicles have the potential to double between 2005 and 2020 to 500 million tonnes of CO_2 per year.

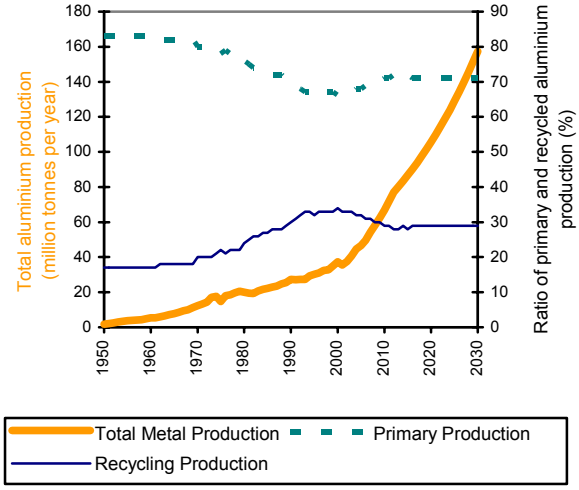
Voluntary Objective 8
The IAI has developed a mass flow model to identify future recycling flows. The industry will report regularly on its global recycling performance.

The aluminium industry is a pioneer in tracking the global flows of its products through the full value chain from mining, through use, to recycling and reuse. To do so it has developed a comprehensive mass flow model based on "Material Flow Analysis" methodology. The industry illustrates the model's output in a flow chart, which is made available to the public on an annual basis. The IAI has published annual mass flow charts since 2003.

The industry is continuously improving the model, with more accurate statistics and with the help of research centres and universities. Due to uncertainties in the data on product life times and recycling rates for some products in certain regions, the IAI is conducting additional research on the 3.5 million tonnes of scrap which has been identified as possibly available for recycling or stored in use.

Around 40 million tonnes of aluminium, from primary and recycled sources, ended up in finished products in 2006.

In the same year, approximately one-third of the metal in products available on the market is sourced from recycled (16 million tonnes) and two-thirds from primary metal (34 million tonnes). Projected growth rates in the demand for high quality, safe and recyclable aluminium products, combined with the long lifetimes of most products, suggest that this ratio of recycled to primary sourced metal is unlikely to change in the short to medium term.



Around 8 million tonnes of scrap from used products (old scrap) were recovered globally in 2006.

Three quarters of all the aluminium ever produced (since the 1880s) is still in productive use. In 2006 this stock had grown close to 600 million tonnes. Of the aluminium currently stored in productive use, equally one third is in buildings (windows, roofing, cladding etc), transport (automotive, public transport etc.) and engineering & cable (overland cable, machinery) applications.

The global stock of aluminium in productive use is growing every year, in 2006 by 24 million tonnes.

The results of the mass flow model in 2006 are shown in the diagram on page 5.

Voluntary Objectives 9 & 10

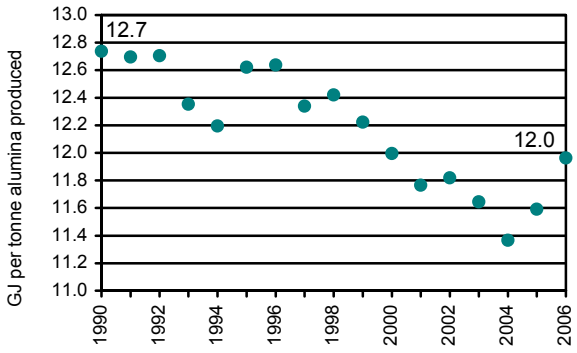
The IAI member companies will seek to reduce their fresh water consumption per tonne of (9) aluminium and (10) alumina produced.

IAI member companies will concentrate efforts to minimise fresh water consumption where there are limited available fresh water resources.

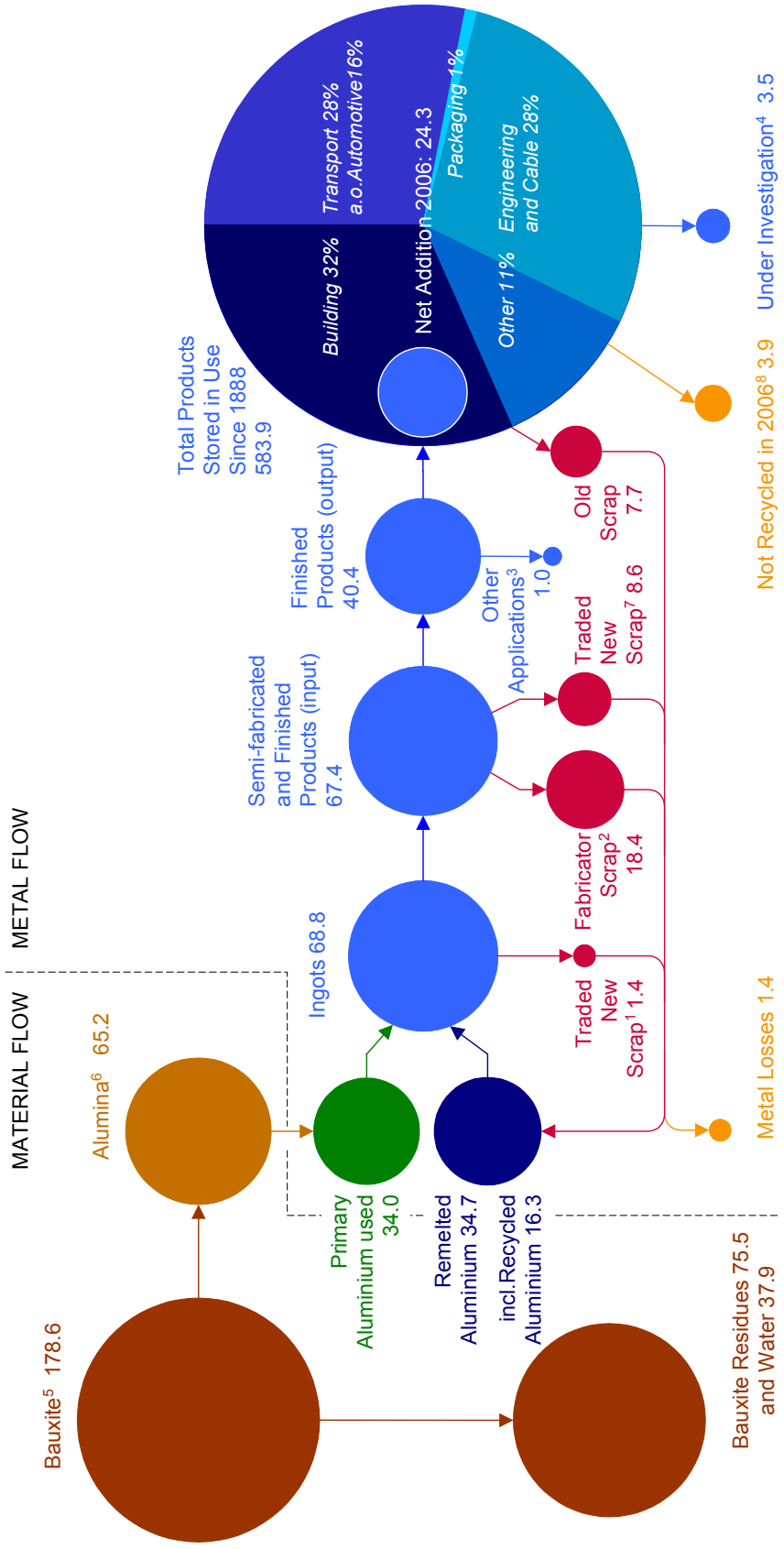
The Institute continues to collect data on fresh water consumption. Due to differences between regions and facilities in the definitions of fresh water consumption and in the level of fresh water stress, further analysis and development of indicators is required before full quantification of the industry's environmental impact can be assessed.

Voluntary Objective 11

The IAI member companies will seek to reduce GHG emissions from the production of alumina per tonne of alumina produced.



The average energy used in the Bayer process to produce one tonne of alumina decreased by 6% between 1990 and 2006. The IAI is developing a quantitative voluntary objective for alumina refining energy efficiency which is expected to be released in May 2008.



Values in millions of metric tonnes. Values might not add up due to rounding. Production stocks not shown
1 Aluminium in skimmings; 2 Scrap generated by foundries, rolling mills and extruders. Most is internal scrap and not taken into account in statistics; 3 Such as powder, paste and deoxidation aluminium (metal property is lost) 4 Area of current research to identify final aluminium destination (reuse, recycling or landfilling); 5 Calculated based on IAI LCI report - update 2005. Includes, depending on the ore, between 30% and 50% alumina; 6 Calculated. Includes on a global average 52% aluminium; 7 Scrap generated during the production of finished products from semis; 8 Landfilled, dissipated into other recycling streams, incinerated, incinerated with energy recovery.

Voluntary Objective 12
The IAI member companies will seek to increase the proportion of bauxite mining land rehabilitated annually.

In 2005, the area of land rehabilitated as a percentage of land mined since operations began, in currently operating mines, is 70%. Globally, bauxite mining disturbs only 25 km^2 a year, an area equivalent in size to one third of Manhattan Island, NY. Every year around 20 km^2 is rehabilitated.

Voluntary Objective 13
The Aluminium Industry recognises that spent pot-lining has properties that makes it a valuable material for use in other processes and will therefore strive to convert all spent pot-lining into feedstocks for other industries, which include cement, steel, mineral wool and construction aggregate companies or to re-use and or process all SPL in its own facilities.

Pending final deposition, the industry will endeavour to store all spent pot-lining in secure, waterproof, ventilated buildings/containers that will maintain the spent pot-lining in a dry state with no potential for the build up of noxious gases.

Spent pot lining (SPL) is an unavoidable by-product of the aluminium smelting process. On average, 25-35 kg of SPL is produced per tonne of aluminium. In 2006, 35% of SPL output was recycled externally out of a total reported output of 245 thousand tonnes of SPL. About 50% of the SPL output was deposited in form of treated deposition or stored pending final deposition or recycling.

The industry has systematically worked to minimize the amount of SPL produced, by extending the lifetime of the lining in the smelter pots. Since the 1970s, SPL has been recognised as a valuable resource for other industries, including as a feedstock in the cement, mineral wool and steel production processes. However, the main barrier to supply of SPL as a feedstock has been economics. Individual smelters do not produce enough SPL to provide a continuous supply of feedstock for a cement plant to justify their conversion to receiving this material. Through collaboration with potential customers, and between companies to increase regional supply, the recycling of this material has become more viable and widespread.

International Aluminium Institute
New Zealand House, Haymarket, London, SW1Y 4TE
Tel: +44 (0) 20 7930 0528
Email: iai@world-aluminium.org
Website: www.world-aluminium.org