Perfluorocarbon (PFC) Emissions

Objective: 50% reduction in PFC emissions per tonne of aluminium production 2006-2020.  
Applies to: Global Aluminium Industry.  
2009 Data Coverage: 60% reported data by production, 40% estimated.  
2009 Performance:

- 31% improvement since 2006;
- 88% reduction since 1990;
- 75% reduction in TOTAL PFC emissions (t CO₂e) since 1990;
- Absolute direct greenhouse gas emissions from all primary aluminium and upstream production processes (bauxite mining, alumina refining, aluminium smelting & casting) remain at 1990 levels, even though production has doubled over the same period.

![Graph showing PFC emissions trend from 1990 to 2020]
Total AC Power used in Smelting

**Objective:** 10% reduction in smelter electrical energy per tonne of aluminium produced by 2010 versus 1990.

**Applies to:** IAI Member & reporting companies.

**2009 Data Coverage:** 60% of global production.

**2009 Performance:** 6% reduction between 1990 and 2009.

**Note:** Dataset does not include Chinese average AC power intensity (not directly reported to IAI), which was 14.2 MWh/t Al, in 2009 according to the China Non-Ferrous Metal Industry Association (CNIA). Inclusion of Chinese data would bring the 1990 - 2009 performance to 9%. From 2010, CNIA data will be included in IAI reporting.

Energy used in Alumina Production

**Objective:** 10% reduction in energy use per tonne of alumina produced for the industry as a whole by 2020 versus 2006 levels.

**Applies to:** Global Aluminium Industry.

**2009 Data Coverage:** 37 IAI reporting companies supplemented with CNIA and CRU data for 35 companies which combined represent 99% of global production.

**2009 Performance:** 8% reduction in global energy used in Low Temperature, High Temperature and Bayer Sinter processes to produce one tonne of alumina since 2006.
Spent Pot Lining

**Objective:** Strive to convert all spent pot-lining (SPL) into feedstocks for other industries, or to re-use and/or process all SPL in its own facilities. Pending final deposition, the industry will endeavour to store all SPL in secure, waterproof, ventilated buildings/containers that will maintain the SPL in a dry state with no potential for the build up of noxious gases.

**Applies to:** Global Aluminium Industry.

**2009 Data Coverage:** c. 55% Member Company production; 40% of global production.

**2009 Performance:** In 2009, 36% of SPL output was recycled externally out of a total reported output of 364,000 tonnes of SPL. More than 40% of the SPL output was deposited in a form of treated deposition or stored pending final deposition or recycling.

Fluoride Emissions

**Objective:** 33% reduction in fluoride (particulate and gaseous) emissions per tonne of aluminium production 1990-2010.

**Applies to:** IAI Member Companies.

**2009 Data Coverage:** 60% IAI membership equivalent to 45% global by production.

**2009 Performance:** 44% improvement since 1990.

Fluctuation in the curve is due to the inclusion of additional reporters in reporting cohort since mid-2000. The IAI is developing indicators that will more accurately reflect fluoride emissions reduction by the global industry.
Bauxite Mine Rehabilitation

Objective: Seek to increase the proportion of bauxite mining land rehabilitated annually.
Applies to: IAI Member Companies.
Progress: Globally, bauxite mining disturbed around 30 km² in 2006, an area equivalent in size to one half of Manhattan Island, NY. In the same year, an equivalent area of mined land was rehabilitated. Bauxite mining has therefore reached a steady state in which newly mined areas are offset by rehabilitation of existing mining areas. From 2010, bauxite mine rehabilitation data will be collected and reported annually.

Fresh Water Consumption

Objective: Seek to reduce fresh water consumption per tonne of aluminium and alumina produced.
Applies to: IAI Member Companies.
Progress: Fresh water is a significant issue to the industry and the Institute continues to collect data on fresh water consumption. There are some smelters that operate with very low water usage and zero water discharge. Progress is being made in reducing water use in many refineries. Due to differences between regions and facilities in the definition of fresh water consumption and and the availability of fresh water (the level of water stress), further analysis and development of indicators is required before full quantification of the industry’s environmental impact can be assessed.

Occupational Health Management

Objective: Implementation of an employee exposure assessment and medical surveillance programme in 95% of IAI member companies’ plants by 2010.
Applies to: IAI Member Companies.
2009 Performance: 99% had employee exposure assessment and medical surveillance programmes in place, as defined in IAI published guidelines.

Environment, Health and Safety Management Systems

Objective: 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.
Applies to: IAI Member Companies.
2009 Performance: The industry achieved this objective, with 97% of plants having EHS management systems in place; 94% having achieved ISO 14000 certification, 46% are OHSAS 18000 certified.
**Safety Performance**

**Objective:** 50% reduction in lost time injury frequency rate and total recordable injury frequency rate by 2010 as compared to 2006.

**Applies to:** IAI Member Companies.

**2009 Data Coverage:** 327 million hours worked at 86 aluminium smelters, 34 alumina refineries and 17 bauxite mines.

**Performance:** Lost Time Injury Rate (LTIR) has remained constant between 1.6 and 1.7 for past 3 years; Total Recordable Injury rate (TRIR) decreased from 5.6 in 2008 to 5.2 in 2009 (from 6.0 in 2007).

**Drivers:** 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 mechanisation and automation as a means of reducing hazards and safety risks.

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**Global Aluminium UBC Recycling**

**Objective:** Global aluminium industry will work to encourage a global aluminium UBC (used beverage cans) recycling target of 75% by 2015.

**2009 Performance:** 69% in 2008, up from 57% 2003.
Aluminium Semi-Shipments

Objective: Monitor annually aluminium semi-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.

2009 Performance: Stabilisation in aluminium semi-fabrication products shipped to the transport sector since 2008; global greenhouse gas savings from the use of aluminium for lightweighting vehicles have the potential to double between 2009 and 2025 to 600 million tonnes of CO₂ per year.

Mass Flow

Objective: Report global recycling performance regularly using the IAI mass flow model.

2009 Performance:
- Preliminary results illustrate that around 44 million tonnes of aluminium, from primary and recycled sources, ended up in finished products in 2009.
- Approximately one-third of the metal in products available on the market is sourced from recycled (19 million tonnes) and two-thirds from primary metal (35 million tonnes).
- Around 10.3 million tonnes of scrap from used products (old scrap) were recovered globally.
- Three quarters of all the aluminium ever produced (since the 1880s) is still in productive use. In 2009 this stock had grown to about 660 million tonnes.
- The global stock of aluminium in productive use is growing every year, in 2009 by 25 million tonnes.

The results of the mass flow model in 2009 are shown in the diagram on page 8.

Market modelling is based on data collected by the regional aluminium associations.
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