Recycling

- Aluminium is infinitely recyclable – approximately 75% of all aluminium ever produced since 1888 is still in productive use, some having been through countless loops of its lifecycle[i].
- Recycling of aluminium saves 80 million tonnes of CO_2 annually.
- Aluminium recycling saves up to 95% of the energy required for primary aluminium production.[ii]
- Aluminium's economic scrap value and ability to be recycled continuously makes the aluminium beverage can the most recycled container in the world with an average recycling rate of 60% and over 90% in some countries.
- Globally, aluminium achieves among the highest material recycling rates, with up to 90% for transport and construction applications

Building *(See http://greenbuilding.world-aluminium.org for details)*

- Aluminium is durable and corrosion resistant, thus reducing maintenance over time.
- Buildings account for up to 40% global energy consumption[iii].
- The most energy efficient buildings start with aluminium. Aluminium components and designs optimize natural lighting and shade, enhance energy management and support designs that make the most of the physical environment.
- Aluminium's unmatched recyclability gives architects a key sustainability design tool.
- In Europe, around 95% of architectural aluminium is collected and recycled.
- Globally, buildings contain some 200 million tonnes of aluminium, which will be available for recycling by future generations time after time - an energy bank for future generations
- Aluminium's high strength-to-weight ratio makes it possible to design light structures with exceptional stability.
- The metal's inherent strength allows aluminium window and curtain wall frames to be very narrow, maximising solar gains for given outer dimensions.
- Aluminium's light weight makes it cheaper and easier to transport and handle safely on site.

Transport *(See http://www.autoaluminum.org for details)*

- The use of one kilogram of aluminium replacing heavier materials in a car or light truck can save a net 20 kg of CO_2 over the life of the vehicle.[iv]
- This figure is even higher for more weight sensitive applications (for instance, up to 80kg CO_2 saved per kg of aluminium used in trains).[v]
- The 15 million tonnes of aluminium used in transport applications – cars, buses, trucks, trains and ships – can save up to 300 million tonnes of CO_2 and 100 billion litres of crude oil over the vehicles' operating life.
- As car manufacturers have sought to improve fuel efficiency, the use of aluminium has grown every year for the past 30 years.
- In 1990, the average passenger car contained between 40 and 80 kg aluminium; in 2009, the average is between 120 and 150 kg[vi].
- While today aluminium accounts for less than 10% of a car's total weight it represents up to 50% of the total material scrap value [a]
- The aluminium industry supports global university research in recycling, vehicle light weighting and improvements in alloy properties.

Packaging

- Aluminium packaging via its unique combination of properties contributes to the efficient fabrication, storage, distribution, retailing and usage of products.
- The aluminium beverage can is one of the most sustainable packaging solutions available, because it protects its contents, is cost-effective and can be recycled after use again and again.
- In North America and in Europe, a used beverage can is produced, filled, distributed, consumed, collected and recycled back into a can within 60 days.
- Aluminium foil is by far the lightest 'complete barrier' material in a packaging composite. For example, a flexible fruit juice pouch or a beverage carton with a thin internal aluminium layer of only a few microns can be 20 times or more lighter than a traditional bottle.
- Aluminium packaging is the "insurance" to protect the energy invested in producing, growing and processing food. It also ensures the additional energy used to get that food to us – in transport, retailing, shopping, storing & cooking – is not wasted.
- 30% of the food in developing countries perishes due to the lack of packaging.[vii]. Aluminium has the best barrier properties to keep food and drinks fresh and safe and to avoid loss, guaranteeing a longer shelf-life, thus contributing to the sustainability of food and drinks products
- Speciality packaging of pharmaceuticals and other medical products protects and maintains sterile conditions during transportation and storage until use.
- Aluminium helps to reduce the impact of used packaging. Aluminium is light and minimises packaging volumes.
- The aluminium drinks can is the most recycled beverage container in the world and most aluminium foil applications are fully recyclable as well.
- The aluminium industry has a long tradition of collecting and recycling used aluminium products and the high economic value of used aluminium packaging is an incentive for continuous improvement in recycling.

Production Data (2008)

Bauxite	210 million metric tonnes (Mt)
Metallurgical Alumina	76 Mt
Prebaked Anodes	17.5 Mt
Primary Aluminium	39.5 Mt
Recycled Aluminium	18 Mt
Semi Fabricated Products	56 Mt
Growth in primary aluminium production 1990-2008	**100%**

Shipments of Semi Fabricated Products to Markets (2008)

		Share of total
Transport	15 Mt	27%
Building & Construction	13.5Mt	24%
Engineering	12 Mt	21%
Packaging	7 Mt	13%
Other	8.5 Mt	15%

Energy Consumption (2008)

Surveyed smelter electrical power efficiency (kWh AC/t Al), 1990-2008	4% improvement
Global alumina refinery energy efficiency (MJ/t Alumina), 2006-2007	5% improvement
Global average power required to smelt one tonne of aluminium	15,000 kWh
Primary energy required to produce one tonne of aluminium from bauxite	170 MJ
Primary energy required to produce one tonne of aluminium from scrap	7.7 MJ

Greenhouse Gas Emissions Performance (2008)

Perfluorocarbon (PFC) emissions intensity (t CO_2e/t Al), 1990-2008	86% reduction
TOTAL PFC emissions (t CO_2e), despite doubling in Al production, 1990-2008	70% reduction
Change in TOTAL Direct GHG emissions from all processes (t CO_2e), despite a doubling in aluminium production, 1990-2008	0%
GHG intensity (Direct & Indirect) of semi fabricated product (t CO_2e/t Al), including recycling savings, 1990-2008	22% reduction
GHG savings from recycling in 2008	80 Mt CO_2e
Cumulative GHG savings from recycling, 1990-2008	1 billion tonnes CO_2e
Potential GHG savings from vehicle light-weighting in 2008	300 Mt CO_2e

Environment, Health & Safety Performance (2008)

Total Recordable Injury Rate, 2000-2008	75% reduction
Lost Time Injury Rate, 2000-2008	66% reduction
Voluntary Objective for Total Recordable Injury Rate, 2006-2010	50% reduction
Voluntary Objective for Lost Time Injury Rate, 2006-2010	50% reduction
Facilities with management systems for EH&S (including ISO 14000)	99%
Facilities with *Employee Exposure Assessment & Medical Surveillance Programs*	100%
Fluoride emissions (kg F/t Al), 1990-2008	36% reduction
Area of land disturbed annually for bauxite mining	30 km^2
Area of previously mined land rehabilitated annually by the industry	30 km^2

[i] Martchek (2006). Modelling More Sustainable Aluminium. International Journal of LCA, Vol 11-1, pp 34-37.
[ii] IAI (2009). Global Aluminium Recycling – a Cornerstone of Sustainable Development.
[iii] UNEP (2007). Buildings and Climate Change – Status, Challenges and Opportunities
[iv] IFEU (2003). Energy Savings by Light-weighting.
[v] IFEU (2004). Energy Savings by Light-weighting II.
[vi] Ducker Worldwide (2008). 2009 Update on North American Light Vehicle Aluminum Content Compared to the Other Countries & Regions of the World.
[vii] Kooijman (1996). Environmental Impact of Packaging Performance in the Food Supply System. Journal of waste management and resource recovery. Vol. 3-2.