



HYDRO

Aluminium – about Hydro and resource efficiency

We deliver durable products





Our solutions



Energy-positive building test center, Bellenberg, Germany

- Produces enough energy to be self-sufficient (126% level of self-sufficiency in 2011);
- Saves CO₂ emissions by direct use of solar photovoltaic energy generated on site (21 400 kg avoided in 2011);
- Delivers excess electricity to the grid.



Solar thermal applications, Poland

- Increase system efficiency (sun to water tank) by 50-70 percent;
- Decrease costs by 7-10%, when aluminium tubes are used alongside aluminium frames, back cover and absorber sheet;
- Adapt to consumer needs: cools in hot climates and heats in cool climates.



HAL4e, Årdal, Norway

- Our newest smelter technology, tested full scale;
- Lower energy consumption and greenhouse gas emissions;
- For the production of 1 million tons of aluminium, saves the equivalent of the annual energy consumption of more than 50 000 households.

Aluminium – HOW?

Hydro's mission is to create a more viable society by developing natural resources and products in innovative and efficient ways.

Hydro demonstrates resource efficiency through:

- minimizing impacts from our production;
- helping customers reduce their impacts through products and solutions; and
- closing the loop through the recycling of aluminium.

How we minimize our impacts

Hydro has been listed on the Dow Jones Sustainability Indexes each year since the series started in 1999. Our non-financial reporting follows the principles of the Global Reporting Initiative and of other international standards.

Early detection of possible environmental challenges is vital. The ongoing loss of biodiversity and degradation of ecosystem services represents a long-term risk for industry. Our environmental strategy aims at no net loss of biodiversity. Hydro participates in the Ecosystem program of the World Business Council for Sustainable Development.

Renewable energy is our preferred choice and about two-thirds of the electricity used in our primary aluminium production is generated from renewable sources. Aluminium production remains energy-intensive. Therefore we are continuously working on improving the efficiency of our processes. Our newest technology HAL4e has achieved stable energy consumption of 12.5 kWh of electricity per kilogram of aluminium produced. On average, Hydro consumes 13.8 kWh. This may not sound like a big reduction, but applied to a production of 1 million tons of aluminium, the energy savings would be 1.3 TWh per year – equal to the annual consumption of more than 50 000 households.

Furthermore we have reduced our direct emissions of CO₂ from electrolysis by more than 70 percent since 1990.

Improvements in technology and restructuring of our smelter portfolio have also significantly reduced our emissions of fluoride and PAH to air per metric ton of primary aluminium produced, by 20 percent and 66 percent, respectively, since 2005.



Our strategy regarding waste from our production processes is to minimize and then reuse or recycle it. Some of the waste from our primary production is for instance used as a raw material in the cement and mineral wool industry.

How we enable durable products

Hydro's solutions are the basis for durable products that are used in several aspects of our daily life. Facades based on aluminium solutions can lead to lower operating costs and enable the buildings we live in to produce as much energy as they consume during operation. This allows self-sufficiency. Some buildings deliver surplus electricity back to the grid.

Aluminium parts reduce the weight of vehicles, lowering fuel consumption and emissions; while increasing safety, through reduced vehicle momentum. The SuperLight car project, where Hydro was one of the participants, reduced the car body weight by 35 percent, through combining steel, aluminium, magnesium and fibre reinforced plastics components.

Aluminium is increasingly used in renewable energy production, especially solar energy. Its different possibilities of application allow broader deployment of solar technologies by increasing system efficiencies.

Excellent barrier properties reduce the cooling needs of food products while improving durability, thus reducing food spoilage. This helps reduce emissions in the food supply chain and in the consumption of beverages. As an example, one aluminium rolling slab produces 740 km of foil and protects 12 000 000 liters of juice through the thin layers of aluminium used in the packaging. Lighter packaging also lowers fuel use and emissions from goods transportation.

Using aluminium also makes economic sense. The durable properties of aluminium such as corrosion resistance, which requires less maintenance, ensures the quality and efficient performance of products over their entire lifetime: vehicles are usually used for over ten years while buildings are in service for at least forty years. Taking account of the life cycle estimates, our solutions reduce costs for the user of the product.

To create durable products, our research & development teams work in close cooperation with our customers. We also partner with universities and research institutes throughout Europe.

Life-cycle approach – closing the loop through recycling

More than 75 percent of the aluminium ever produced is still in use. In Europe approximately 95 percent of the aluminium in automotive applications and in commercial buildings is recycled. Recycling reduces the pressure on extraction of raw materials and on energy use as it uses only 5 percent of the energy required for primary aluminium production. Aluminium retains the energy used to make it and stores it for future use in its multiple lives. This is why we call our metal an “energy bank”.

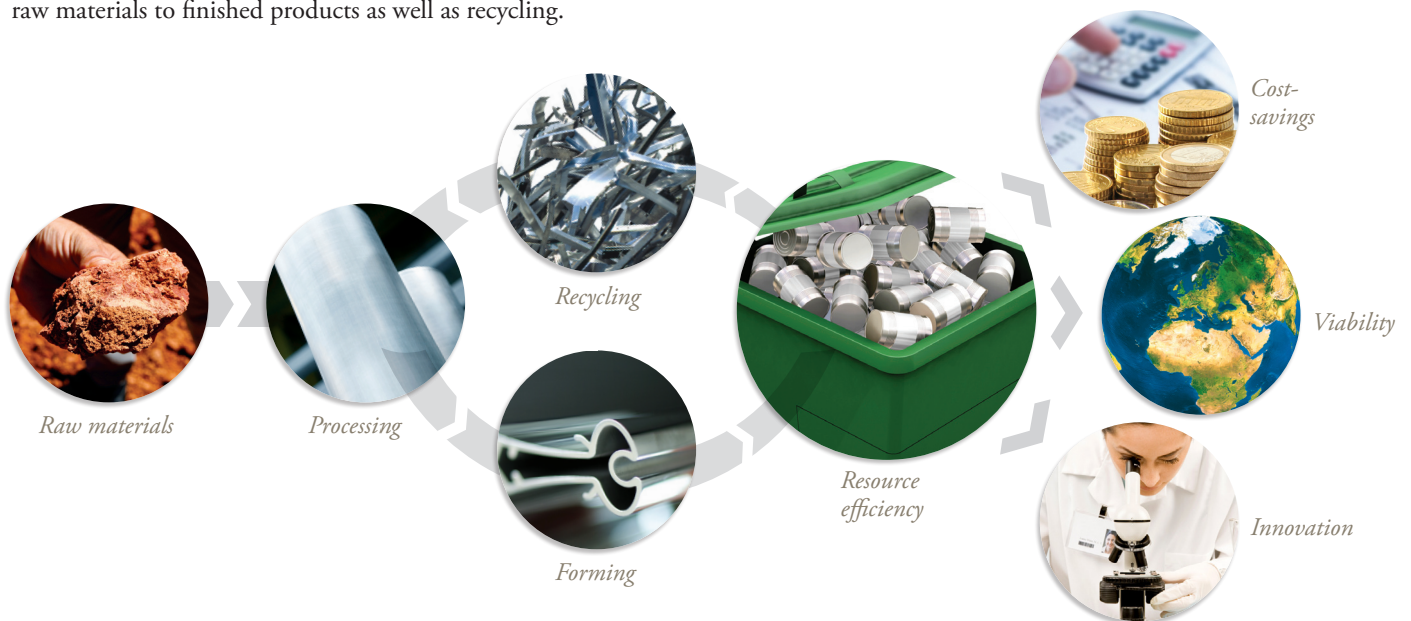
Today, Hydro recycles aluminium in many of its more than 40 casthouses and remelting plants worldwide. We increased our amount of recycled metal by 35 percent from 2009. Hydro invests in increased recycling capacity and has an ambition to recycle 1 000 000 tons of contaminated and post-consumer scrap in 2020.

Hydro is committed to ensuring that the energy “banked” in existing aluminium products never disappears. We support initiatives throughout Europe to improve collection, sorting and processing of scrap to improve the recycling rates and quality of the material. Hydro is actively involved in the platforms Metal Packaging Europe and Metals for Buildings.



Aluminium – WHAT?

Hydro is a major global supplier of high-quality aluminium for applications in various market segments, such as building, transport, packaging, renewable energy and engineering. Based in Norway, the company has a strong presence in Europe and operations worldwide covering every step of the production chain, from the extraction of raw materials to finished products as well as recycling.



● Bauxite

Bauxite is aluminium's raw material. This reddish coloured mineral is mostly found in Australia, China, Africa and South America. Bauxite is then refined into alumina – a white powder which looks a bit like table salt. In Brazil, Hydro owns two bauxite mines and one alumina refinery. Four kilos of bauxite give two kilos of alumina which are then necessary to produce one kilo of aluminium.

● Processing

The performance of our product components is linked to the high quality of the metal they are made from. Our advanced technological expertise allows the production of unwrought aluminium in a wide range of shapes and alloys to fit any use. Pure aluminium is produced through a chemical reaction under high intensity electrical current. Hydro has reduced its direct emissions of CO₂ from electrolysis by more than 70 percent since 1990.

● Extrusion and rolling

Our product solutions are based on aluminium extrusions and rolled products. Both processes turn metal ingots into various shapes. There is virtually no end to what shape aluminium products can take to meet customer needs. Different types of surface treatment can further improve the metal's properties. With 19 extrusion plants and five rolling mills, Hydro is ideally placed to supply the European market.

● Recycling

Recyclability is one of aluminium's greatest benefits. Aluminium can be recycled over and over again without losing its initial properties. Moreover, remelting used metal requires up to 95 percent less energy than for the primary production. In our twelve European remelting and recycling facilities, we reuse our own production waste and recycle scrap from our customers, such as old packaging, building and vehicles scrap reclaimed through established collection schemes.

Hydro is a global supplier of aluminium with activities throughout the value chain, from bauxite extraction to the production of rolled and extruded aluminium products and building systems. Based in Norway, the company employs 23,000 people in more than 40 countries.

Rooted in a century of experience in renewable energy production, technology development and progressive partnerships, Hydro is committed to strengthening the viability of the customers and communities we serve.

Hydro

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