Sectoral Approaches to International Climate Change Policy

Industry Perspectives - Aluminium

IEA International Workshop

Session 3: **Vehicles for Sectoral Approaches to Climate Mitigation Goals**

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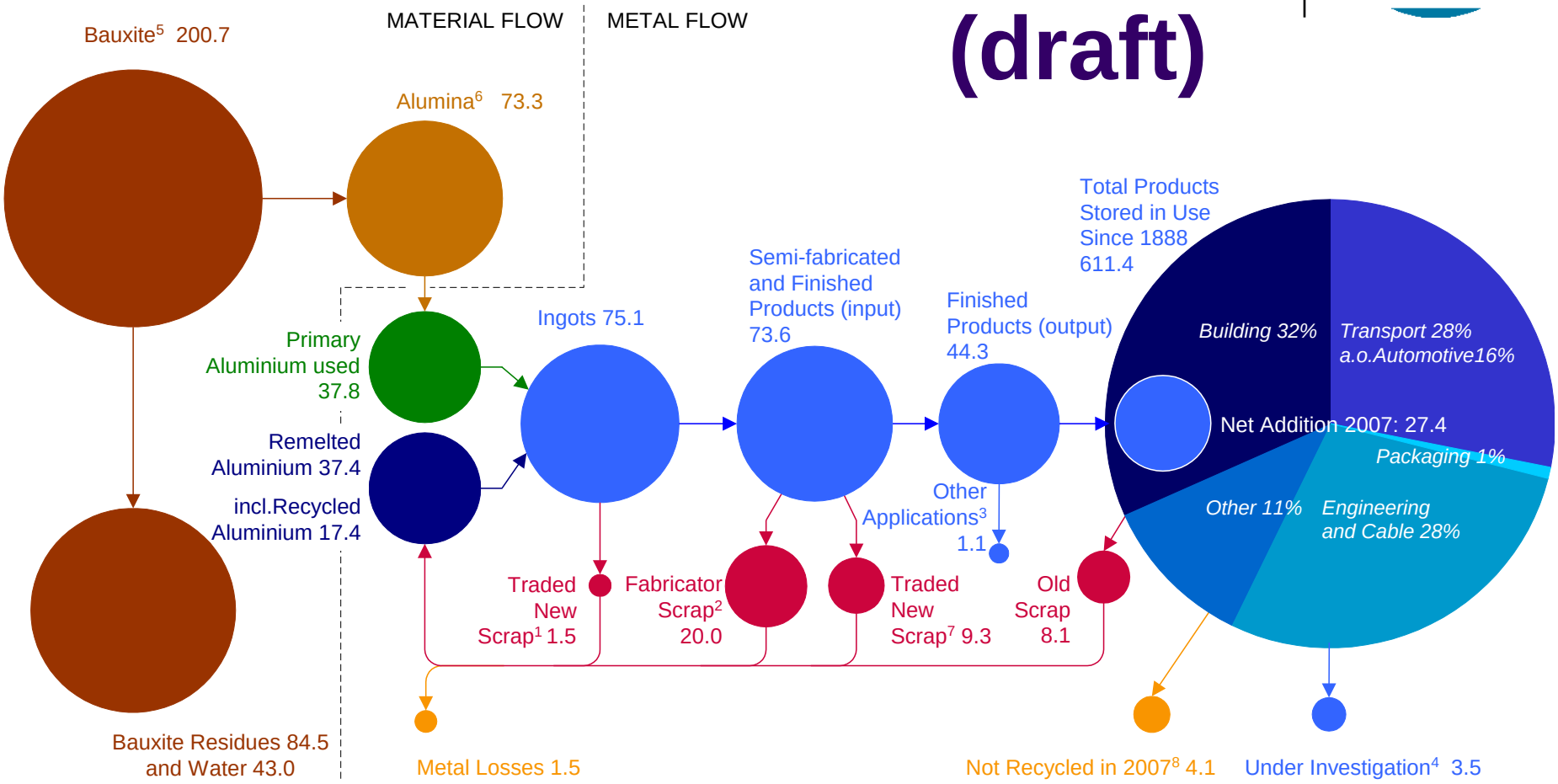
Aluminium - a global life cycle
Global Aluminium Flow 2007 (draft)

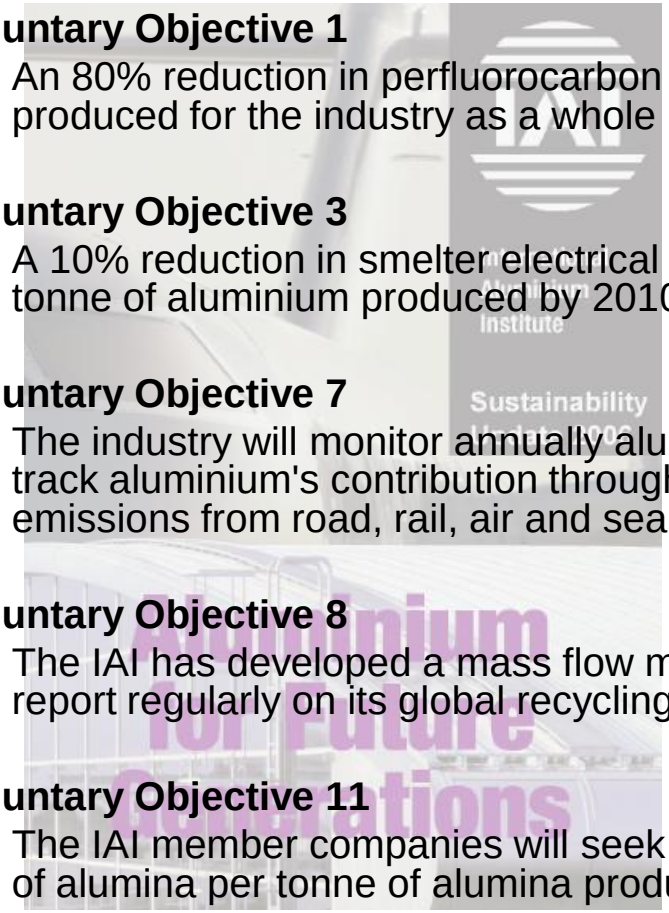


Values in millions of metric tonnes. Values might not add up due to rounding. Production stocks not shown
1 Aluminium in skimmings; 2 Scrap generated by foundries, rolling mills and extruders. Most is internal scrap and not taken into account in statistics; 3 Such as powder, paste and deoxidation aluminium (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.

Source: GARC, May 08

“Aluminium for Future Generations” Global Sustainability Initiative

13 voluntary objectives covering key indicators, including:



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.

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

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.

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

Voluntary Objective 11

- The IAI member companies will seek to reduce greenhouse gas emissions from the production of alumina per tonne of alumina produced

ANNUAL DATA REPORTING & BENCHMARKING

Key Performance Results (1)

- The Aluminium Industry is well advanced in addressing GHG emissions on a **voluntary global basis**. IAI since 36 years. 13 voluntary objectives covering key indicators
- GHG Inventory data from interlocking standards, IPCC Guidelines, WRI/WBCSD GHG Protocol and sector specifics – less than 40% of primary production covered by Kyoto
- Electrical energy required to produce 1t of primary aluminium has been reduced by 6% since 1990. 50% of electricity from Hydropower
- 86% reduction in Perfluorocarbon (PFC) emissions per tonne of production between 1990 & 2006 despite 80% growth in production.
- 75% reduction in total PFC emissions between 1990 & 2006
- 14% reduction in total direct greenhouse gas emissions between 2000 & 2005 despite a 20% growth in production
- 17% reduction in greenhouse gas emissions from both direct and indirect sources per tonne of production between 2000 & 2005
- Direct emissions are stabilizing but indirect emissions will continue to increase with growth – different stakeholders

Key Performance Results (2)

- The recycling of aluminium requires up to 95% less energy than that required for primary aluminium production. Recycling aluminium from used products saves close to 80mil tonnes of GHG emissions per year
- Worldwide, aluminium products are becoming less GHG intense on a per tonne shipped basis. This is due to: lower emissions from primary aluminium facilities, improvements in energy efficiency and increases in the percentage of recycled metal relative to primary metal
- High recycling rates: automotive up to 95%; buildings 98%; beverage cans 63%
- The Industry's global supply of aluminium products from recycled metal has increased from 17% in 1960 to 33% today and is projected to approach 40% by 2020. Since its inception, post consumer aluminium recycling has already saved a billion metric tonnes CO2
- Globally, the use of aluminium in cars & light trucks produced in 2006 will lead to potential savings, over the lifecycle of the vehicles of: around *140 million tonnes of CO2* equivalent greenhouse gases; primary energy equivalent to over *50 billion litres of crude oil*. E.g. cars: 1t of alu saves 20t of CO2e emissions over the lifetime
- Example: avoided emissions from vehicle light-weighting can be in the same order or more than emissions from the total production of primary aluminium worldwide

5 Key Elements of a Sectoral Approach

Global coverage
- IAI membership 80% of world production
- Data from over 60% of primary production
- Lifecycle approach to climate change mitigation

Common methodologies
- Alu Sector GHG Protocol (2006)
- IPCC National GHG Inventories Guidance (2006)
- IAI / USEPA PFC Measurement Methodology (update due in 2008)
- ISO14064 GHG M'ment (2006)
- ISO14044 LCA (2006)

Voluntary objectives
- Common global quantitative goals
- PFCs per tonne aluminium reduction of 80% by 2010 compared to 1990
- Energy efficiency improvement of 10% by 2010 compared to 1990

Over 80% reduction in PFCs (as CO_2eq) per tonne of aluminium produced between 1990 & 2006

75% reduction in <u>TOTAL</u> PFC emissions between 1990 & 2006 despite 80% growth in production

14% reduction in <u>TOTAL</u> direct GHG emissions between 2000 & 2005 despite a 20% growth in production

Reporting & Verification
- PFC data from 1990 to 2006
- Life Cycle Inventories in 2000 and 2005
- Database of **ALL** GHG emissions from Al production
- Data published annually – www.world-aluminium.org
- External verification

Performance drivers
- Benchmarking within technologies and over time
- Best practice sharing
- Expertise & equipment to conduct GHG measurements for accurate Tier 3 accounting

In conclusion: Aluminium delivers a quantified example for a global improvement of a sector climate footprint

- Aluminium is a $ priced globally traded commodity! Each economic cycle starts with commodities
- Sector approaches can deliver substantial results even on a voluntary basis. It takes years to build a robust system addressing sustainability
- Quantitative considerations are only part of the story, pricing issues are even more relevant

  Upstream: CO2 cost pass through from utilities to main users where regional trading systems are enforced, e.g. Europe where for aluminium approx 60% of electricity is delivered from grids

  Downstream: material and product performance and recycling – who gets the benefits allocated (often multi-material issues)
- WBCSD Policy direction 2050 suggest two main components to interact: global carbon markets / carbon price and technology. To build the system, a process and timeline is proposed
- Copenhagen will be too early for any agreements on sector related figures but, an opportunity to discuss ambitions, frameworks etc
- Interactions between sectors need to be better explored in order to avoid new silo landscapes

Still many questions

- What is a sufficient participation (companies and countries)?
- Availability and reliability of emissions data (Russia/China?)
- Volume of credits, prices and buyers?
- How to recognize full life cycle benefits and promote recycling to help satisfy the growing demand for aluminium?
- Role of international associations
  - Negotiation of baselines and other terms of agreement
- Role of independent international authorities (CDM model or a new multilateral agreement)
  - Monitoring/Supervision of the system
  - Enforcement issues
- Country-based approach
  - Legal authority to ensure compliance