

KN06 - The Aluminium Industry's Progress on Sustainability

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Abstract

An increased focus on sustainability in public and political discourse and in the markets for many products creates an opportunity for the aluminium industry as the underlying properties of aluminium make it suitable as an efficient and sustainable alternative to competing materials. However, to grasp these opportunities the aluminium industry must also demonstrate the sustainability of production systems. Six key 'impact opportunities' are identified for sustainability of the aluminium industry: climate change, people, emissions & waste, biodiversity, water and circularity. Progress in the development of key components of an industry response are assessed for each impact opportunity.

Keywords: Sustainability, Greenhouse gas emissions, Aluminium industry, UN Sustainable Development Goals.

1. Introduction

For many decades sustainability has been an important issue for companies and industries. Over time it has evolved from an initial emphasis on pollutants and environmental impacts to a broader consideration of issues including economic and financial sustainability and topics across the three accepted pillars of environment, social and governance.

Similarly companies and industry are moving from addressing sustainability as a reputational issue – the so-called social 'licence to operate' – to integrating it more comprehensively into business structures and decision-making.

This change was driven partially by an increased interest from the public (also consumers) in sustainability and the impact of consumption and production of goods and services. The resultant response from business has been a closer examination of upstream supply chains, and an opportunity to differentiate and market output on the basis of sustainability performance.

Marketing and differentiation on the basis of sustainability credentials is becoming as, or more, significant in choices between materials (e.g., aluminium vs steel); as it is in choices between sources of the same material (aluminium from different suppliers).

2. Aluminium Properties Contributing to Sustainability

The aluminium industry benefits from an emphasis on sustainability in choices between materials. Aluminium's properties make it a more efficient and sustainable alternative in many applications.

The properties of aluminium can specifically improve sustainability performance of other sectors. For example, the protective and impermeable nature of aluminium enables it to be considered for food and drink packaging, as well as medicinal packaging, reducing wastage and decreasing health risks. Electrical and heat conductivity properties qualify aluminium as an option in heat exchangers, and essential for renewable energy generation, electricity transmission and energy storage.

Other properties also provide a performance or efficiency advantage for aluminium in comparison to competing materials. For example, the durability of aluminium leads to lower maintenance costs and longer lifetimes in buildings and construction. Easy formability assists lower-cost design elements in automotive and transport applications. Aluminium’s low weight (for a given strength) provides an efficiency benefit in almost all applications – e.g., vehicle performance, costs of transport of food.

High current rates of recycling, and the ability to recycle scrap at competitive cost, are perhaps the most important advantage of aluminium in all markets and an advantage that can be expected to grow in importance as governments and industry seek to increase circularity.

A market study by CRU International, commissioned by the International Aluminium Institute[1], estimated that demand for aluminium will grow at an average rate of approximately 4 % per annum or higher over the period 2020 to 2030 in key market segments of transport, packaging and electrical. This growth is mainly driven by increased focus on sustainability.

3. Key Sustainability Issues for the Aluminium Industry

To capture benefits from the forecast increased demand for aluminium – driven by a focus on sustainability – the aluminium industry must meet customer expectations on the sustainability of the production process. This will include meeting specific thresholds on key issues, and demonstrating continuous improvement.

The International Aluminium Institute (IAI) conducted a qualitative analysis of the relative impact of aluminium (production and use) on the achievement of each of the 17 United Nations (UN) Sustainable Development Goals (SDGs) [2]. The conclusions of the analysis were that the aluminium industry contributed to all 17 UN SDGs, and split the SDGs into three groups of high, medium and low contribution.

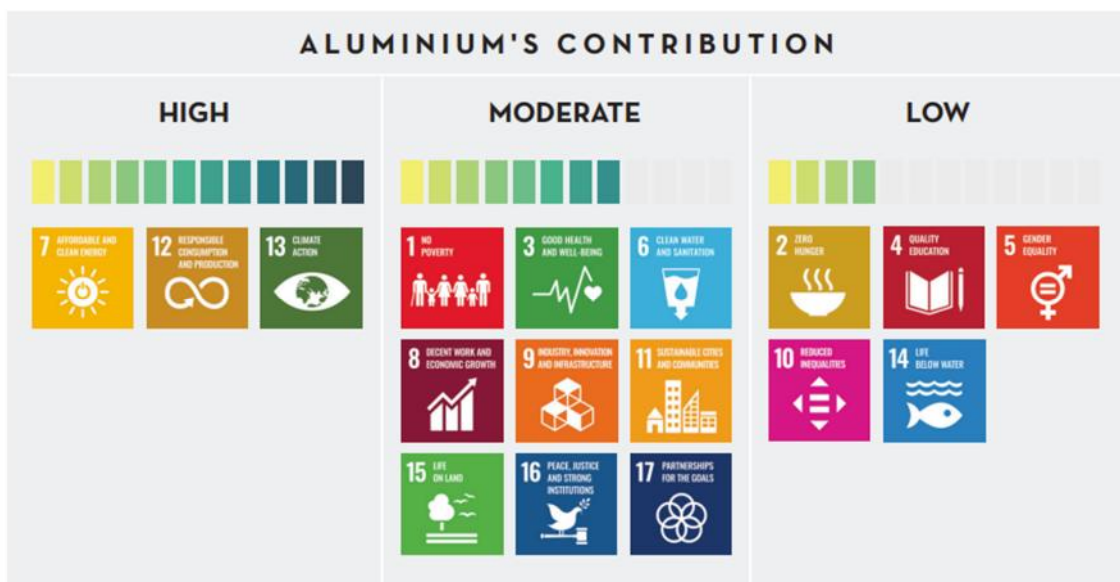


Figure 1. Aluminium’s contribution to the UN sustainable development goals [2].

Further work within the IAI membership distilled these different contributions to identify six ‘impact opportunities’ – the areas where action by the aluminium industry can have the largest impact on sustainability performance, and hence make the greatest contribution to the achievement of the SDGs. These six impact opportunities are:

- Climate change;
- People;
- Emissions & waste;
- Biodiversity;
- Water;
- Circularity.

The six impact opportunities should not be interpreted as the entirety of the aluminium industry’s contribution to the SDGs or sustainability.

3.1. The Six Impact Opportunities

There are significant levels of complexity within the impact opportunities, notably within the impact opportunity of ‘people’ which encompasses: both positive and negative impacts; impacts on workers, communities, consumers and society; and socio-economic, health and educational impacts.

Furthermore, there are also significant interactions between all impact opportunities – for example climate change has significant impacts on biodiversity, water and people; and wastes could be addressed through recycling or utilisation (circularity).

Nevertheless, the six impact opportunities provide a useful framework to consider and manage the aluminium industry’s contribution to improved sustainability.

3.2. Progress in Addressing the Six impact Opportunities

There is no reason to assume that the impact opportunities are of equal importance or that progress should be even – but all impact opportunities should be addressed and progressed. In reality the aluminium industry is making different rates of progress against each of the six impact opportunities.

Table 1. Progress for each impact opportunity.

| | Climate Change | People | Emissions & Waste | Bio-diversity | Water | Circularity |
|----------------------------------|----------------|--------|-------------------|---------------|-------|-------------|
| Base Knowledge | ✓✓ | ✓ | ✓✓ | ✓ | ✓ | ✓✓ |
| Sector Ambition | ✓ | - | ✓ | ✓ | - | ✓✓ |
| Measurable Goals | ✓✓ | - | ✓ | - | ✓ | ✓✓ |
| Metrics to Track Progress | ✓✓✓ | - | ✓✓ | ✓ | ✓ | ✓✓ |
| Technology/Knowledge Development | ✓✓ | ✓✓ | ✓✓ | ✓ | ✓ | ✓✓ |
| Technology/Knowledge Deployment | ✓ | ✓ | ✓✓ | - | ✓ | ✓ |
| Implementation and Action | ✓✓ | ✓✓ | ✓✓ | ✓ | ✓ | ✓✓ |

Note: ✓✓✓, ✓✓, ✓, - = estimated relative levels of progress.

Addressing each impact opportunity can be considered against a framework of components. These components are outlined in the table above along with an estimate of the global aluminium industry’s progress for each of the impact opportunities.

4. GHG Emission Reductions in the Aluminium Industry

Of the six impact opportunities, climate change emerges as the most important through public and political feedback and through more objective assessments of impact. The aluminium industry is an important component of society's climate change response as it represents a significant source of emissions – 2-4 % of global emissions depending on definitions and scope – and a material that can reduce emissions in many applications, as described earlier.

Through the International Aluminium Institute, the industry has detailed global trajectories that would need to be followed for the industry to meet accepted global climate change targets such as net zero, beyond 2 degrees and 1.5 degrees. [3]. This work also outlines the technology pathways required to deliver the required emissions reductions.

Yet to be published data of aluminium industry emissions in the time since the pathways were released, suggests that the industry is currently tracking closer to a business-as-usual trajectory than either the beyond-2-degrees or 1.5-degrees trajectories. However, there have also been a significant number of announcements of projects to develop and implement the technologies required for the pathways, with these projects occurring in all the major aluminium production regions.

5. Conclusions

An increased focus on sustainability from the public and consumers presents an opportunity for the aluminium industry given the underlying properties of aluminium as a material that see it used as a more efficient or a sustainable alternative to competing materials.

To grasp these opportunities the aluminium industry must address key aspects of sustainability of production – particularly in the areas of: climate change, people, emissions & waste, biodiversity, water and circularity.

Future work should seek to deepen the action on each of these issues and aggregate initiatives from individual players into a coherent position that can be presented on behalf of the industry. Collaboration between industry participants will be critical in achieving improvements within the timeframes expected.

6. Acknowledgements

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7. References

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