

# The role of Green Alumina in Green Aluminium

**Damien Clancy**

Chairman, RUSAL Aughinish, Ireland

Corresponding author: [damien.Clancy@augh.com](mailto:damien.Clancy@augh.com)

## Abstract



Environmental stewardship is central to RUSAL's manufacture of green aluminium. Approximately 80% of RUSAL's aluminium is produced using environmental-friendly hydropower, generated without any harmful emissions. Green alumina also has a key role to play in creating green aluminium. This paper is a comprehensive review of the production of green alumina at Aughinish and the environmental sustainability of the refinery. This sustainability is multi-faceted and includes bauxite residue disposal management, continuous monitoring to ensure there is no impact on the local environment and the minimisation of CO<sub>2</sub> emissions. The "Carbon Footprint" of Aughinish is among the lowest in the industry and has been accomplished through sustained improvements in energy consumption and the conversion of all thermal and electrical energy generation to Natural Gas. The performance of Aughinish in terms of CO<sub>2</sub> emissions is benchmarked against the industry and in particular against Chinese performance. It will be clearly shown that Aughinish is indeed a world leader in this area and a benchmark against which other refineries can be compared. The paper focuses primarily on Greenhouse Gas emissions. Other areas of environmental sustainability of the refinery such as residue management, water emissions and community relations are also reviewed.

**Keywords:** Green alumina; carbon footprint; greenhouse gases; environmental sustainability

## 1. Introduction.

Rusal Aughinish Alumina Limited (AAL) refinery is located on the west coast of Ireland. The plant commenced operation in 1983 with a current production capability of 1.99Mt/yr.

AAL has a structured management approach to the operation of the business in terms of product quality, process control, environment, safety, training and analytical capability. The refinery functions within an accredited Environmental Management system (ISO14001) and Energy Management system (ISO50001).

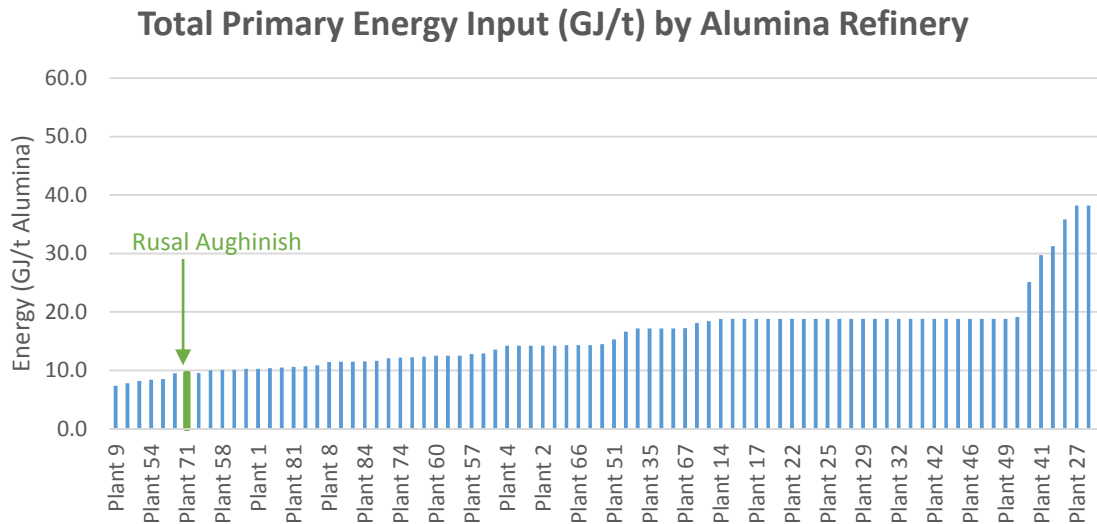
The refinery operates under an industrial emissions license (IEL) issued and enforced by the Environmental Protection Agency (EPA) of Ireland. The environmental management system is a key tool to ensure compliance with the IEL and to drive continuous improvement of the environmental performance of the plant and to safeguard sustainability.

Environmental stewardship is central to RUSAL's manufacture of green aluminium. Approximately 80% of RUSAL's aluminium is produced using environmental-friendly hydropower, generated without any harmful emissions.

Green alumina has a key role to play in creating green aluminium. The production of green alumina at AAL is key to the environmental sustainability of the refinery. This sustainability is multi-faceted and includes bauxite residue disposal management, continuous monitoring to ensure there is no impact on the local environment and minimisation of CO<sub>2</sub> emissions.

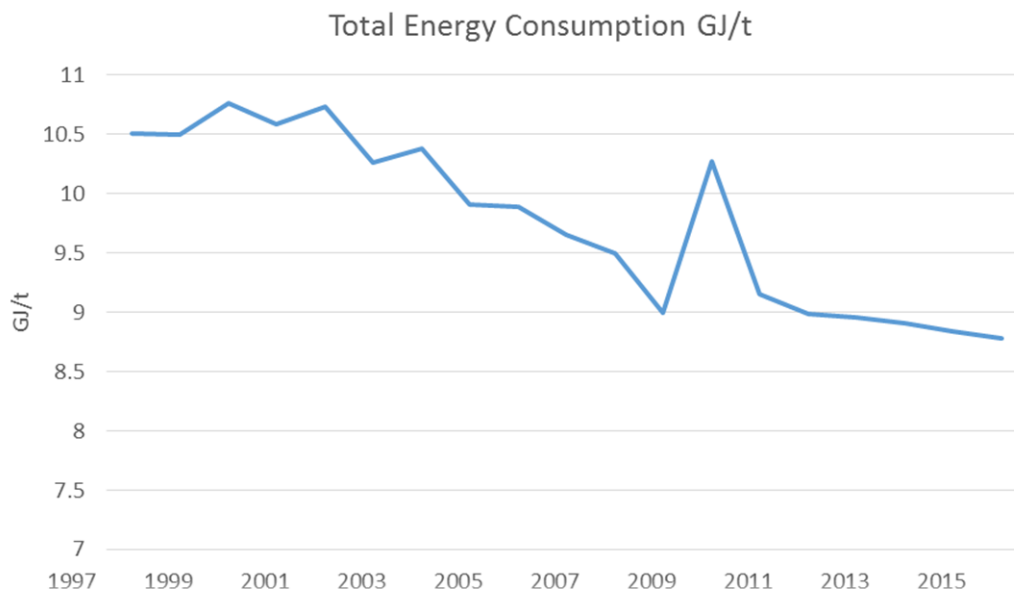
## 2. Energy Efficiency

The International Aluminium Institute (IAI) data shows AAL to be the 7<sup>th</sup> most efficient alumina refinery in the world (Figure 1). This is a very significant achievement given that AAL is a high temperature refinery and operates a digestion technology which was originally designed over fifty years ago.



**Figure 1. Total energy efficiency by alumina refinery (Source IAI 2015)**

The total energy consumption of the AAL (Figure 2) has undergone a continuous reduction over the past 20 years (with the exception of the 2009 global economic crisis). The continuous improvement in energy consumption has been driven through operational improvements, production creep and innovative solutions supporting the economic sustainability of the business.



**Figure 2. Total energy consumption reduction at the Rusal Aughinish alumina refinery**

In conclusion, the overall environmental footprint ensures that AAL produces green alumina with minimal impact on the environment and the community and thereby plays its role in the manufacture of green aluminium in the overall Rusal group.

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