

2019 LIFE CYCLE INVENTORY SURVEY GLOBAL SUMMARY

May 2022



INTERNATIONAL
ALUMINIUM

Aluminium, shaping a better tomorrow

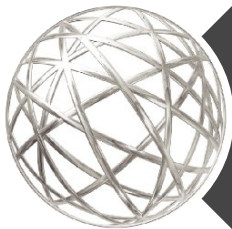
Content



Life cycle inventory data



Life cycle impact results



Greenhouse Gases

LIFE CYCLE INVENTORY DATA

Background

- ❑ 5-yearly LCI survey was set for data collection for 2020
- ❑ 2019 was selected instead, to minimise the Covid impact
- ❑ 2019 LCIs rely on
 - ✓ Life Cycle Inventory Survey
 - ✓ Bauxite Residue Survey
 - ✓ Energy Survey
 - ✓ Anode Effect Survey

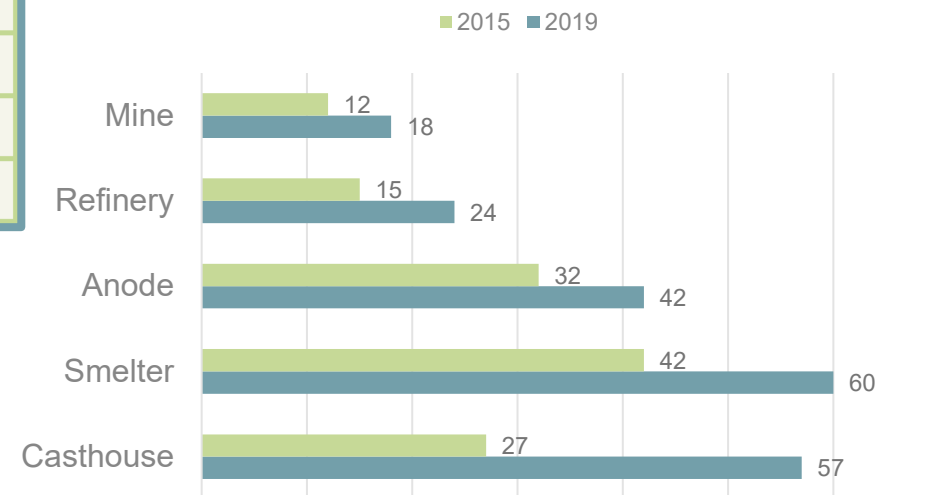


Survey Response

Response rate by production

	Overall			Energy		
	2015	2019		2015	2019	
Mine	42%	30%	↓	43%	35%	↓
Refinery	39%	41%	↑	95%	89%	↑
Anode	17%	21%	↑	32%	32%	↓
Smelter	24%	30%	↑	94%	94%	→
Casthouse	17%	23%	↑	36%	39%	↑

Number of LCI reporting sites





Life Cycle Inventory

Performance Driven Differences against 2015 LCIs

++

+

—

Mine

Particulates
into Air

Area
physically
mined in 2019

Solid Waste
Disposal

Refinery

Road/Rail
Transport

Aqueous
suspended
solids

Solid industrial
waste (ex red
mud)

Oil and
grease/total
hydrocarbons

Sulfur dioxide

Mercury

Anode

Refractory
input

Recycled
refractory

Electrolysis

Road/Rail
Transport

Fluoride into
Water

SPL landfill

SPL recycled

Casting

Chlorine input

LIFE CYCLE IMPACT RESULTS

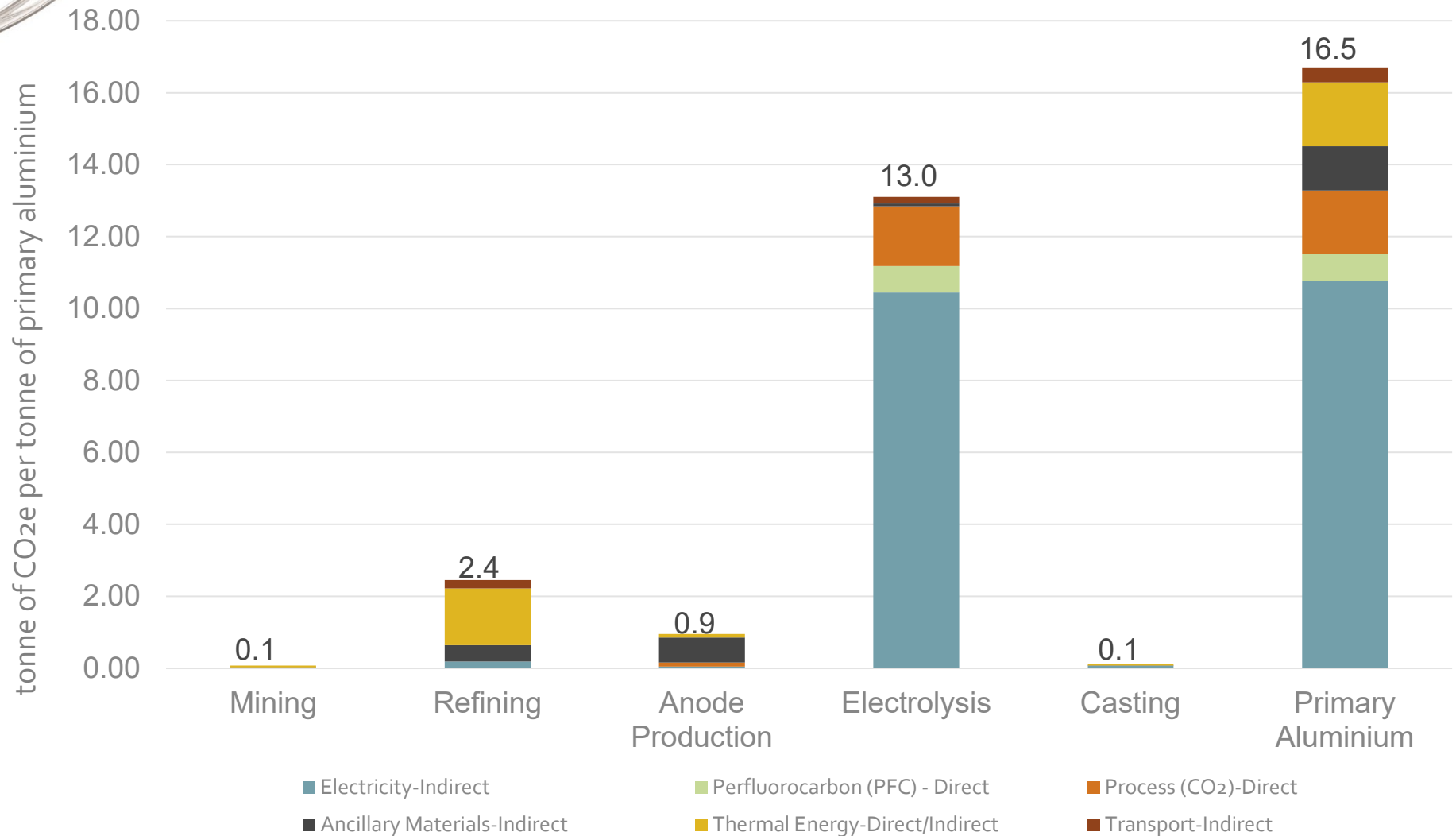


Impact Categories

CML 2001 – Aug.2016	2019
Acidification Potential (AP) [kg SO ₂ -Equiv.]	84
Depletion of fossil energy resources (DFE) [MJ]	166,000
Eutrophication Potential (EP) [kg Phosphate-Equiv.]	6
Global Warming Potential (GWP 100 years) [tonne CO ₂ -Equiv.]	16.5
Ozone Layer Depletion Potential (ODP) [kg R11-Equiv.]	9.2E-15
Photochemical Ozone Creation Potential (POCP) [kg Ethene-Equiv.]	6
Water Scarcity Footprint (WSFP)- AWARE [m ³ Water-Equiv.]	12

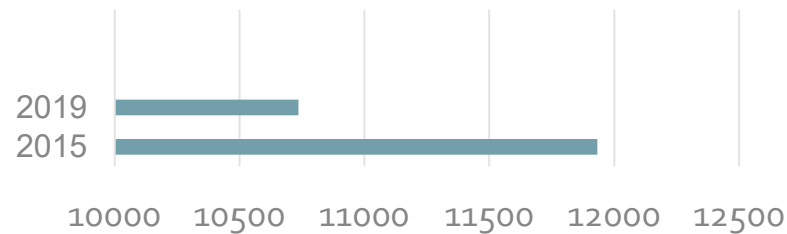
GREENHOUSE GASES

2019 Global Warming Potential (GWP 100 years)

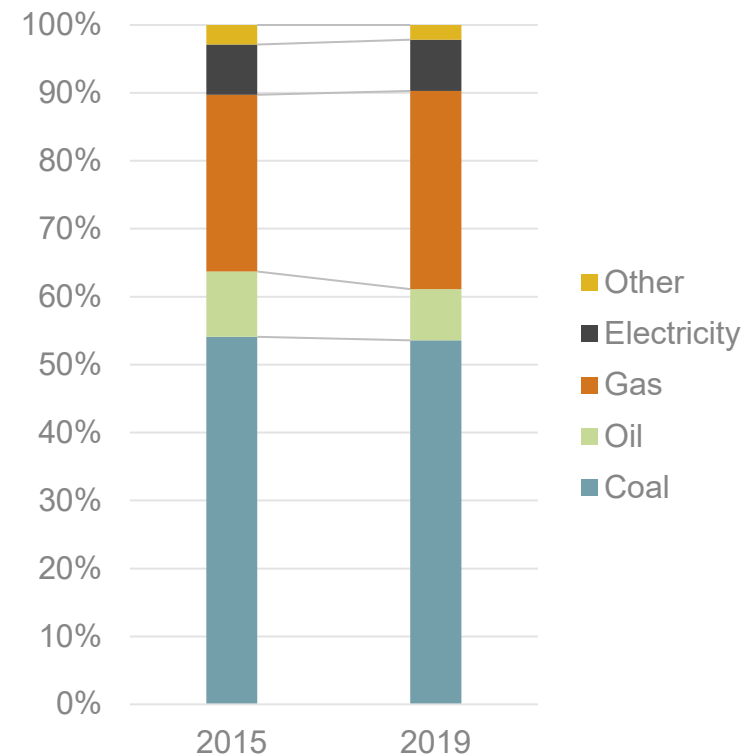


Improvement - Refinery

Refining energy intensity (MJ/t)



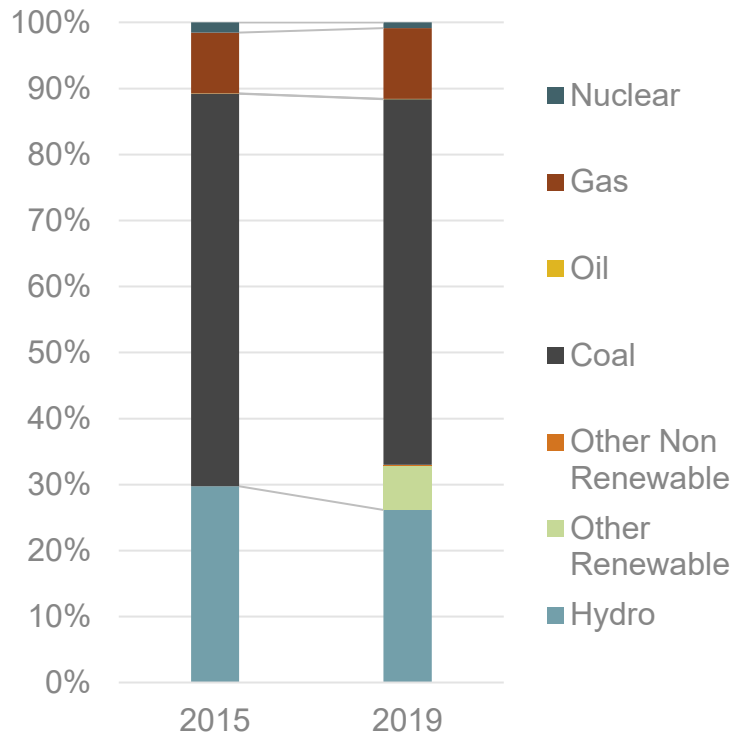
Refining energy mix



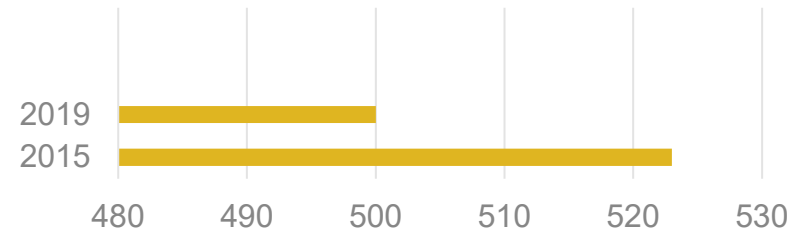
- ✓ Refining energy intensity is reduced by 10% from 2015;
- ✓ Refineries consumed more gas and electricity, and less coal and oil.

Improvement - Smelter

Smelting power mix



Gross anode consumption (kg/t Al)



- ✓ Renewable electricity consumption is increasing;
- ✓ Gross anode consumption reduced by over 4% from 2015.

Where GHGs goes up...



BAUXITE

Refining

Transport

The average distance travelled by rail has tripled.



ALUMINIUM

Electrolysis

PFCs

Although high voltage PFCs continually reduced from 2015, the total PFCs (from accounting perspective) increase due to inclusive of low voltage PFCs for the first time.

A detailed Environmental Metrics report will
soon follow.

Linlin Wu

Manager – Statistical Analysis

wu@international-aluminium.org



international-aluminium.org



[International Aluminium Institute](#)



[@Int_Aluminium](#)



[Subscribe to IAI External Newsletter](#)