ASX Announcement *1 September 2023*

Alumina Limited 2022 Sustainability Update

Attached is a copy of Alumina Limited's 2022 Sustainability Update.

The 2022 Sustainability Update and an associated Sustainability Data Pack provide a detailed view of AWAC's sustainability performance and are available on the Company web site at https://www.aluminalimited.com/sustainability-report

The AWAC refineries remain in the first quartile on the refinery global emissions curve, with refinery emissions intensity improving 1% to 0.51 tonnes of CO2e per tonne of alumina produced.

Portland remained in the second quartile on the global smelter emissions curve, with emissions intensity improving 1.5% to 12.91 tonnes of CO2e per tonne of aluminium produced.

AWAC's total emissions on an equity basis were 8.4Mt of GHG, a 47% decrease compared to the 2010 baseline.

This ASX announcement was approved and authorised for release by Mike Ferraro, Chief Executive Officer.

KATHERINE KLOEDEN
COMPANY SECRETARY

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Forward-looking statements

Neither Alumina Limited nor any other person warrants or guarantees the future performance of Alumina Limited or any return on any investment made in Alumina Limited securities. This document may contain certain forward-looking statements, including forward-looking statements within the meaning of the US Private Securities Litigation Reform Act of 1995. The words "anticipate", "aim", "believe", "expect", "project", "estimate", "forecast", "intend", "likely", "should", "could", "will", "may", "target", "plan" and other similar expressions (including indications of "objectives") are intended to identify forward-looking statements. Indications of, and guidance on, future financial position and performance and distributions, and statements regarding Alumina Limited's future developments and the market outlook, are also forward-looking statements.

Any forward-looking statements contained in this document are not guarantees of future performance. Such forward-looking statements involve known and unknown risks, uncertainties and other factors, many of which are beyond the control of Alumina Limited and its directors, officers, employees and agents that may cause actual results to differ materially from those expressed or implied in such statements. Those risks, uncertainties and other factors include (without limitation): (a) material adverse changes in global economic conditions, alumina or aluminium industry conditions or the markets served by AWAC; (b) changes in production or development costs, production levels or sales agreements; (c) changes in laws, regulations, policies or regulatory decision making; (d) changes in alumina or aluminium prices or currency exchange rates; (e) Alumina Limited does not hold a majority interest in AWAC and decisions made by majority vote may not be in the best interests of Alumina Limited; and (f) the other risk factors summarised in Alumina Limited's Annual Report 2022. Readers should not place undue reliance on forward-looking statements. Except as required by law, Alumina Limited disclaims any responsibility to update or revise any forward-looking statements to reflect any new information or any change in the events, conditions or circumstances on which a statement is based or to which it relates.

ALUMINA LIMITED

SUSTAINABILITY UPDATE 2022

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SUSTAINABILITY UPDATE 2022

This report is interactive.

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Data tables are available in a separate excel spreadsheet to assist users in data extraction and analysis.

Please visit the Alumina Limited website to download files.

Front cover: observation tower at Alcoa of Australia's mine site rehabilitation area in Western Australia's Peel region.

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ABOUT THIS REPORT

This report is produced annually and covers Alumina's environmental, social and governance performance for the calendar year 1 January 2022 to 31 December 2022.

This report should be read in conjunction with the **2022 Data Pack**, which can be downloaded from the **Alumina Limited website**.

Alumina Limited is engaged in a global joint venture (JV) with Alcoa Corporation who are the manager and operator of our joint Alcoa World Alumina and Chemicals (AWAC) operations.

This report is focused on the sustainability impacts of Alumina as a business, and the impacts of the AWAC joint venture business and operations.

This includes assets wholly owned by AWAC and assets in which AWAC holds less than 100% equity interest, but which are managed by Alcoa. AWAC also holds a non-operator interest in the Ma'aden alumina refinery and bauxite mine, the MRN bauxite mine in Brazil (divested during 2022) and CBG bauxite mine in Guinea; these sites are excluded from performance information in this report, as AWAC does not control these facilities.

A map of all AWAC operations and facilities (both AWAC operated and non-AWAC operated) can be found on page 7, and detailed ownership information on page 22.

For the purposes of this report, references to 'AWAC' describe:

- the physical assets, interests and operations that form the basis of the joint venture (e.g., AWAC's Huntly bauxite mine)
- the outcomes and performance levels from the operation of these assets (e.g., AWAC's production levels, revenue, emissions, resource usage, market position)
- the governance procedures and frameworks that determine the strategic directions, investments and acquisitions of the enterprise (e.g., the AWAC Strategic Council).

The material topics, structure and draft content of this report were reviewed by the Sustainability Committee of Alumina's Board, and the final content was approved by the Board.

This report references the Global Reporting Initiative (GRI) Standards 2021, and the Sustainability Accounting Standards Board (SASB) Metals & Mining Standard located in the **2022 Data Pack**. We have also drawn on elements of the International Integrated Reporting Framework. Alumina's previous Sustainability Report was released on 30 August 2022.

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REPORT DATA AND LIMITATIONS

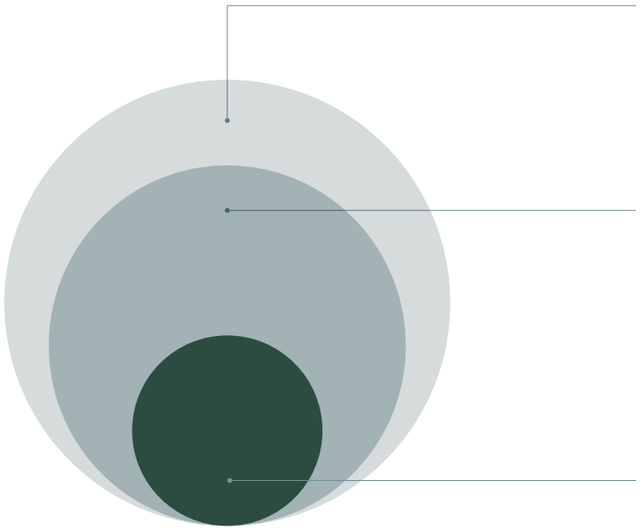
All financial data in this report is expressed in US dollars unless otherwise specified, and environmental data is metric. Restatements of data from our 2021 report are noted where applicable in this report and in the 2022 Data Pack.

All data pertaining to Alumina Limited has been prepared by our own organisation.

Disclosures of management approach for AWAC operations are directly based on Alcoa's 2022 Sustainability Report, which is overseen by senior leaders of Alcoa.

As Alumina is the non-operating JV partner in AWAC, we are dependent on Alcoa to provide AWAC performance data for this report. Alcoa obtained limited assurance over its 2022 Sustainability Report, including over some of the metrics included in this report. The assurance statement can be seen on appendix B, page 131 of Alcoa's report. The apportionment of AWAC data in this report (as outlined below) has been subject to management review, but not external assurance.

Unless otherwise noted, data presented about AWAC is generally on a 'full facility' basis. The most common bases for reporting are:



Full facility

100% of the ownership of AWAC facilities, including the equity interest of minority owners of the Alumar Refinery (100%) and the Portland Smelter (100%) – e.g. representing 11.2 Mt of GHG emissions (2022)

AWAC/Equity share

Proportionate equity ownership of AWAC facilities.

Mines: Huntly (100%), Willowdale (100%) and Juruti (100%);
Refineries: Pinjarra (100%), Kwinana (100%), Wagerup (100%), San Ciprian (100%) and Alumar (39.96%);
Smelter: Portland (55%) – e.g. representing 8.4 Mt of GHG emissions (2022)

Alumina Limited

40% equity share of AWAC/equity basis – e.g. representing 3.4 Mt of GHG emissions (2022)

Alcoa-wide basis: As the AWAC assets are a subset of Alcoa's business operations, in some instances it is not feasible to separate out AWAC-specific information. We have indicated in footnotes throughout where data refers to the whole of Alcoa (AWAC plus non-AWAC), rather than to AWAC.

We value your constructive feedback on Alumina's 2022 Sustainability Report and performance. To provide feedback or for any questions regarding this report, please contact:

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Further information on prior reports can be found here:
aluminalimited.com/sustainability-report/

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CHAIRMAN AND CEO — OVERVIEW

We are pleased to share Alumina Limited's 2022 Sustainability Update, outlining our performance, challenges, and commitment to a sustainable future.

AWAC's decarbonisation strategy

AWAC's decarbonisation strategy involves investing in research and development on MVR and EC[1] for alumina refining.

Recently, the first stage of the MVR for the Low Carbon Alumina Refining project, funded by the Australian Renewable Energy Agency (ARENA), has been concluded. As a result, the project will progress to the second stage whereby a pilot module will be installed at the Wagerup alumina refinery in Western Australia in 2024. Alcoa is also separately developing an inert anode technology to smelt carbon free aluminium.

PERFORMANCE

Safety

AWAC' joint venture's long-term safety goal is zero fatalities and serious injuries. Pleasingly, in 2022 there were no fatalities or serious injuries at AWAC-managed facilities. AWAC has maintained fatality-free operations since 2017.

Greenhouse gases emissions

Alumina Limited, through the AWAC joint venture, set its ambition to reduce AWAC's direct and indirect emissions (Scope 1 and 2) by 45% by 2030 (from a 2010 baseline), ultimately achieving net zero by 2050.

AWAC's absolute emissions decreased three percent in 2022, to 11.2 Mt of GHG on a full-facility basis due to reductions in the emissions intensity of the Portland Smelter's electricity supply, but also as a result of reduced alumina production.

On an equity basis, AWAC's emissions amounted to 8.4 Mt of GHG, which represents a 47% decrease compared to the 2010 baseline of 15.8 Mt of GHG.

All of AWAC's alumina refineries are in the first quartile for emissions intensity, with an average emissions intensity of 0.510 tonnes of CO_2e per tonne of alumina produced. This is compared to the global average of 1.26 tonnes[2] of CO_2e per tonne of alumina produced (excluding AWAC).

Portland Smelter's emissions intensity decreased to 12.91 tonnes of GHG per tonne of production, primarily due to increased renewables in grid electricity purchased.

Rehabilitation

Our five-year ratio of active mining disturbance of 0.82:1 (2018-2022) indicates that more areas were rehabilitated or transferred to other land users compared to newly disturbed land for active mining.

Economic contribution

Over 60 years of operating in Australia, AWAC has delivered enormous value to its shareholders, employees, and community providing a consistent record of economic contribution. In the past five years, Alcoa of Australia paid more than A$2.8 billion in taxes and royalties and A$3.5 billion in wages and benefits to employees.

The Pinjarra refinery in WA celebrated its 50-year anniversary in 2022. Since the beginning of its operations in 1972, the refinery has contributed to the local community and has generated significant economic growth in the region. Over its lifetime, the refinery has produced over 160 million tonnes of alumina.

More detailed information is available in relevant sections of this report. We trust that this report provides relevant insight into key sustainability matters for Alumina Limited and the AWAC joint venture. We are aiming to continue to progress and develop our sustainability reporting and welcome your feedback.

W Peter Day Chairman

Mike Ferraro Chief Executive Officer

DATA TABLES

The data tables are available in an excel spreadsheet to assist users in data extraction and analysis. Please visit the **Alumina Limited website** to download files.

1. MVR (Mechanical Vapour Recompression) is a steam recycling technology to reduce carbon emissions in the refining process. EC (Electric Calcination) replaces a direct-fire calcination plant with one powered by renewable energy to support decarbonisation of the alumina refining. **2.** As per CRU global alumina refinery emissions intensity data in April 2023.

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ALUMINA LIMITED

Alumina Limited provides investors with unique access to some of the world's highest quality alumina assets. We are a leading Australian company listed on the Australian Securities Exchange (ASX) and traded on the OTC Markets in the United States. Our sole investment is a 40% share in the AWAC joint venture.

The remaining 60% of AWAC is owned by our partner, Alcoa Corporation (Alcoa). Alcoa is also the operator of the joint venture.

Alumina's purpose is to deliver long-term value to our stakeholders through our investment in AWAC. Sustainability is fundamental to that purpose: aluminium has an important role to play in a net-zero carbon, circular economy, and by responsibly managing our sustainability impacts, AWAC is well positioned to deliver on that market demand.

Our role as co-owner of the AWAC joint venture is to be an active investor. We monitor and engage with Alcoa to help maximise AWAC's performance, manage long-term risks and optimise the value we deliver to our shareholders.

To do this we:

- **Understand the industry and markets we operate in.**
  We watch our markets closely, looking at the future prospects for bauxite, alumina and aluminium to strategically influence how to price and sell our commodities, and when to invest or divest.
- **Provide a different set of perspectives to the joint venture (JV), backed by deep expertise, to constructively work with Alcoa and support strategic decision making.**
  To do this, Alumina conducts its own analysis and is informed by independent research to understand long-term risks and opportunities, and we have regular conversations with our partner on AWAC.
- **Engage with government through membership of industry associations to represent our shareholders' interests.**
- **Prioritise our sustainability agenda.**
  We work with Alcoa to review AWAC's long-term sustainability strategies and objectives, and assess its performance in human rights, environmental and labour practices, and maintain a focus on AWAC's social license to operate.

AWAC

AWAC is one of the world's largest producers of alumina. Its assets include long-life bauxite mines and alumina refineries in Australia, Brazil and Spain, and a 55% interest in the Portland aluminium smelter in Victoria, Australia. Alcoa is the operator of all these AWAC assets. AWAC also has non-operator interests in Brazil, Saudi Arabia and Guinea. The AWAC interest in the MRN bauxite mine in Brazil was divested during H1 2022. For further detail of AWAC entities and interests, see page 22.

AWAC also has continued responsibility for the rehabilitation of four closed sites in Australia, Suriname and the USA. See Data Pack for details on AWAC's Transformation Projects.

AWAC is structured as an unincorporated joint venture based on Agreements between Alumina Limited and Alcoa Corporation. AWAC's headquarters are Alcoa's headquarters in Pittsburgh, Pennsylvania, USA.

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MAP OF OPERATIONS

AWAC employed 6,064 personnel across its global operations, including employees that have both AWAC and non-AWAC-related roles.

AWAC's products – bauxite, alumina and aluminium – are sold globally. AWAC has major customers in Argentina, Asia, and the Middle East, and Alcoa itself is also a major buyer of its smelting products. AWAC maintains a spread of customers across a portfolio of countries and regions to minimise concentration risk.

GLOBAL

11.8m tonnes
alumina production[1]

3.5m bdt
3rd party bauxite shipments

159k tonnes
aluminium production

ATLANTIC

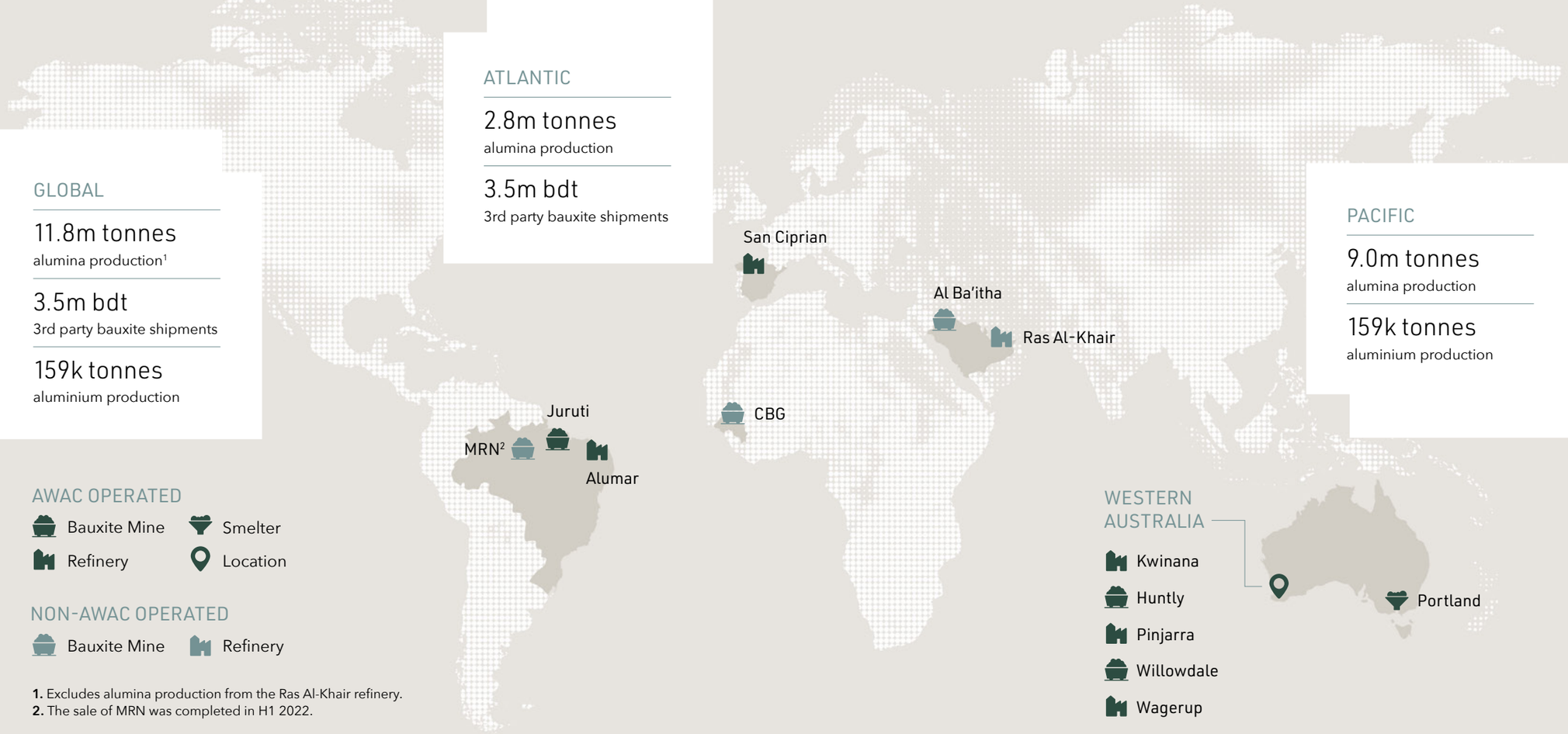
2.8m tonnes
alumina production

3.5m bdt
3rd party bauxite shipments

PACIFIC

9.0m tonnes
alumina production

159k tonnes
aluminium production



AWAC OPERATED

Bauxite Mine
Refinery
Smelter
Location

NON-AWAC OPERATED

Bauxite Mine
Refinery

1. Excludes alumina production from the Ras Al-Khair refinery.
2. The sale of MRN was completed in H1 2022.

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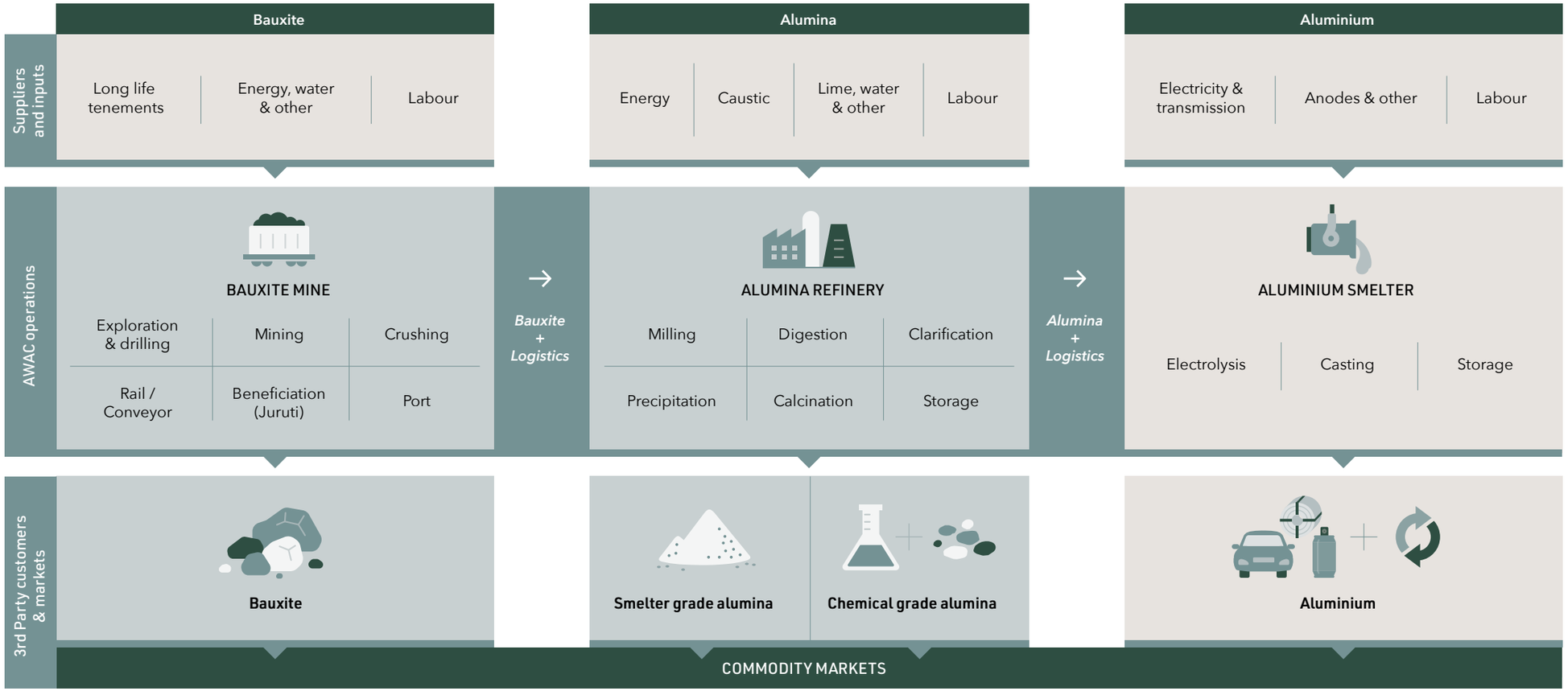
THE ALUMINIUM VALUE CHAIN



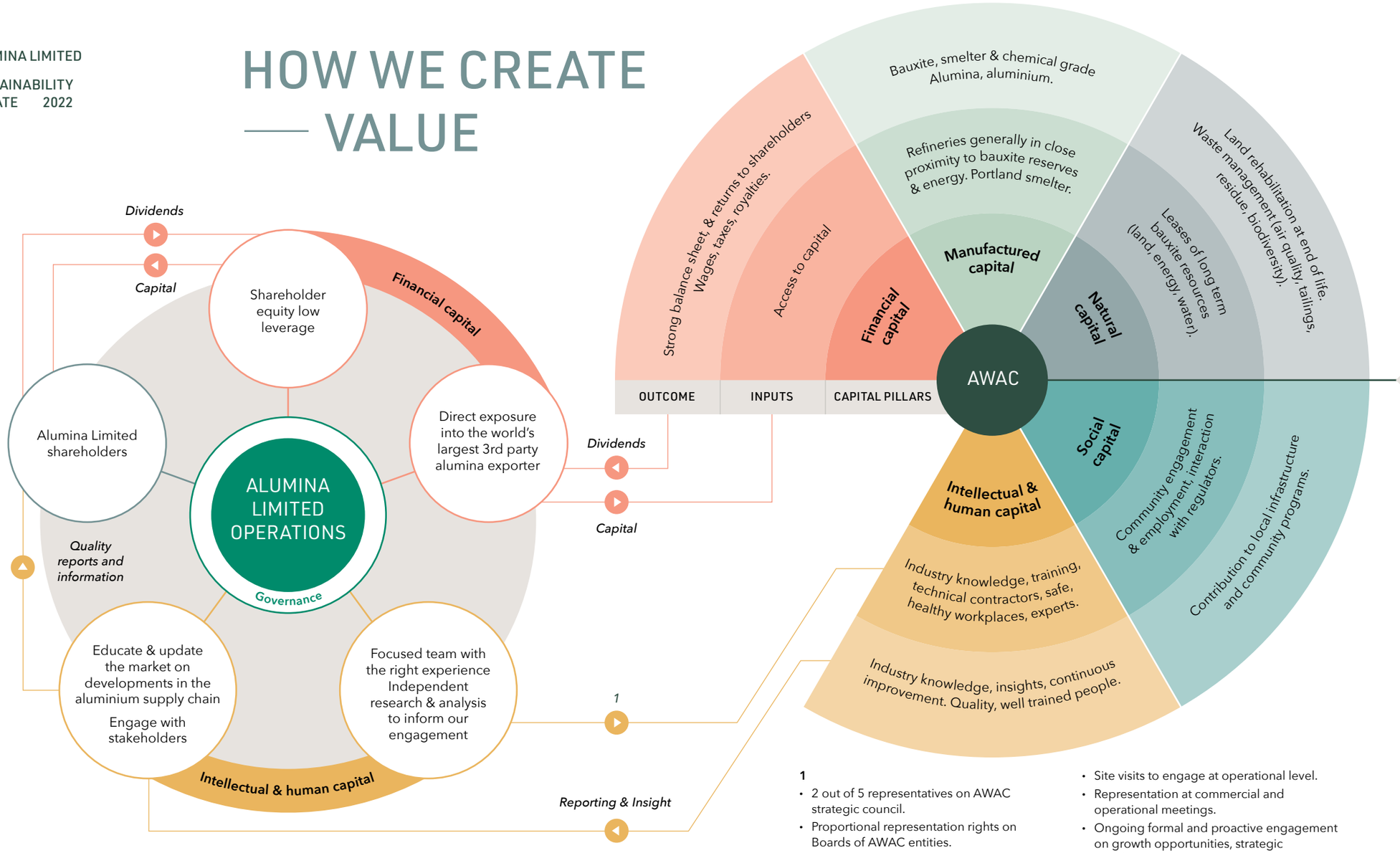
Material issues

- Occupational health and safety
- Local commitment with communities
- Waste, tailings & residue management
- Rehabilitation
- Land management & biodiversity
- Social licence
- Water stewardship

- Waste, tailings & residue management
- Energy efficiency and greenhouse emissions
- Water stewardship
- Local commitment with communities
- Occupational health and safety
- Facilities closure

- Occupational health and safety
- Community
- Energy efficiency and greenhouse emissions
- Rehabilitation
- Climate change
- Facilities closure

HOW WE CREATE — VALUE



1

- 2 out of 5 representatives on AWAC strategic council.
- Proportional representation rights on Boards of AWAC entities.
- Site visits to engage at operational level.
- Representation at commercial and operational meetings.
- Ongoing formal and proactive engagement on growth opportunities, strategic developments and operational matters.

AWAC

The joint venture's ability to create value is a result of the interrelationship between its capital pillars.

For example, AWAC's foundations began with pioneer geologists exploring the Darling Ranges. With seed capital, the support of the government and the community, AWAC has been able to employ locals, mine its long term bauxite tenement, be a cornerstone customer for the WA gas industry, produce high quality alumina, pay royalties and taxes, and provide returns on invested capital to shareholders.

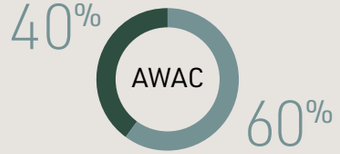
At the end of a mine pit or an asset's life, we focus on rehabilitating the area to the highest standard, and aim to ensure no net loss of biodiversity.

AWAC JOINT VENTURE

Alumina Limited

Owns 40% of AWAC.

We offer investors a unique relatively undiluted exposure to the alumina market.



Alcoa

Owns 60% of AWAC.

Manager & day-to-day operator of AWAC's global operations.

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OUR STAKEHOLDERS AND MATERIAL TOPICS

Alumina has a focused set of direct stakeholders, and a broader set of indirect stakeholders through AWAC. The interests of both sets are considered in establishing our material topics.

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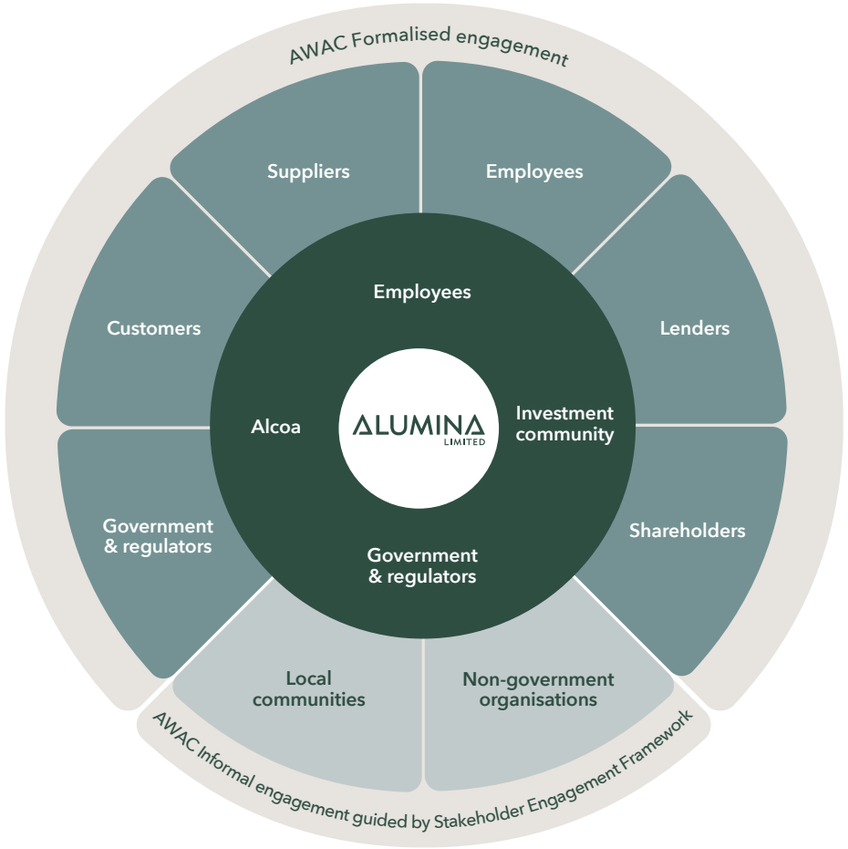

For more detail on how Alcoa engages with its stakeholders, see the Alcoa 2022 Sustainability Report page 18.

ALUMINA'S STAKEHOLDERS

We engage with our direct and indirect stakeholders as follows:

Investment community	Institutional investors Retail shareholders Fund managers and analysts Ratings agencies and proxy advisers Financial markets	Investor presentations and roadshows, including an ESG Investor Briefing in 2022 (available on the Company's website); in-person meetings with institutional investors and proxy advisers; Annual General Meeting; program of shareholder communication in accordance with our shareholder communication strategy, which also outlines the avenues available to shareholders to ask questions, provide feedback, and communicate any critical concerns; correspondence and communication with ESG agencies
Government and regulators	Government	Required reporting e.g. tax contributions, ASX listing rules, engagement via industry associations
	Industry associations	Participation in the development of industry submissions and attendance at industry events
Employees		Given the small size of our team, interaction is direct and constant
Our joint venture partner, Alcoa		Formal and informal pathways including AWAC Strategic Council, AWAC entity representation, direct engagement (see page 17)

Alumina's management captures feedback from investors and stakeholders during roadshows, discussions with the joint venture partner and general feedback from other parties such as industry associations and consultants. These matters are reported to the Sustainability Committee throughout the year.

No critical concerns from stakeholders were communicated to Alumina during 2022.

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AWAC'S STAKEHOLDERS

AWAC's stakeholders, as defined by Alcoa, include any person or organisation that directly impacts, or is impacted by, its activities. These are set out in the diagram on the previous page.

AWAC has formalised and contractual channels of engagement for stakeholders, which include customers, suppliers, governments, employees and stockholders. Interaction with community groups and NGOs occurs more informally, guided by Alcoa's Stakeholder Engagement Framework. Alcoa utilises the framework to gather feedback from communities where they operate to manage risks and opportunities associated with community rights and interests. More detail on the framework is provided on page 53.

OUR SUSTAINABILITY CONTEXT

AWAC acknowledges the UN Sustainable Development Goals (SDGs) as an articulation of the world's most pressing sustainability challenges. As part of its role as an active investor, Alumina also keeps track of trends specifically influencing our industry.

- The world is working to combat **climate change**. Net zero commitments – and action – are now an expectation of our stakeholders as we transition to a zero-carbon economy. Aluminium is currently an emissions-intensive product, but one that has a key role in that transition (see page 18). The Commonwealth of Australia is reforming the **Safeguard Mechanism** to reduce greenhouse gas emissions limits. The Government's climate goals aim to reduce national emissions to 43 percent below 2005 levels by 2030 and achieve net zero emissions by 2050. These goals are consistent with Australia's National Determined Contribution under the Paris Agreement and strengthen Australia's competitiveness in a decarbonising global economy. The reform requires Australia's large direct emitters, such as facilities within the minerals industry, to keep their net emissions below an emissions baseline to incentivise safeguard facilities to decarbonise operations. All Alcoa of Australia facilities are captured within the Safeguard Mechanism, with the exception of the Willowdale Mine. This facility does not exceed the current coverage threshold of 100,000 tonnes of Scope 1 (direct) CO2e emissions per annum. Implications of Safeguard Mechanism reform for AWAC are outlined on page 25.
- **Biodiversity loss** is occurring and there is recognition that this is an issue of increasing significance. The launch of the Taskforce for Nature-related Financial Disclosures has increased investor attention to this topic. As outlined in Alcoa's global Biodiversity Policy, minimising environmental impacts and promoting sustainable land use is an important part of the sustainability strategy. We continue to follow and develop science-based rehabilitation practices to protect critical biodiversity.
- Moving towards a circular economy will be a critical means to combat climate change, biodiversity loss and waste. While there are moves towards **a circular economy**, the majority of production continues to be linear. Aluminium, as an endlessly recyclable commodity, is a natural fit for the circular economy. However, mining also generates waste in a form of tailings and residue that is challenging to repurpose.
- Stable access to water is critical to mining operations, but **water scarcity** can lead to conflicts with local communities and ecosystem disruptions. There is increasing focus on use of water and management of waste water.
- Social expectations are growing in relation to companies' responsibility for the **end of life of mine sites**: that they will have ongoing social, economic and biodiversity value, that communities will be supported through the transition, and that they can expect multi-generational benefits.
- There is increased attention on miners' relationships with **indigenous peoples**, including impacts on cultural heritage as well as opportunities for economic empowerment and self-determination.
- The minerals industry has been traditionally male-dominated, and despite moves to improve **diversity and inclusion**, there has been increased awareness of incidents of sexual harassment, racism and bullying.
- AWAC has policies in place to comply with all country and local laws prohibiting **harassment or bullying** in the workplace. While the legal definition of harassment and bullying may vary by country and local jurisdiction, Alcoa's global Harassment and Bullying Free Workplace Policy does not tolerate behaviours such as:
  - Intimidating or threatening behaviour, verbal or physical
  - Degrading comments or jokes
  - Showing disrespect towards others because of individual characteristics
  - Sending or displaying material that is offensive or pornographic (including emails, texts, instant messages or pictures)
  - Racial, ethnic, gender, religious, homophobic or age-related derogatory remarks
  - Sexual harassment.
- The minerals industry is facing challenges with **talent attraction and retention**.
- **Modern slavery and human rights** risks in the minerals sector operations and supply chains are relevant matters to be considered and addressed. Alcoa's Human Rights Policy prohibits all forms of modern slavery. AWAC expanded the Supplier Sustainability Program to include ESG risk screening of the entire supply base (screening includes working conditions, child and forced labour and human trafficking). For the most recent reporting year, there were no violations of human rights identified in AWAC's operations or supply chains, but AWAC continues to expand its due diligence procedures.

- Interest in companies' environmental, social and governance **(ESG) performance** continues to increase, with investors looking for actions to back up commitments, and reliable data to avoid claims of 'greenwashing'.
- The minerals industry has made significant improvements in **health and safety** over the last decade. However, it still has one of the highest rates of fatalities of any industry. AWAC's long-term **safety** goal is zero fatalities and serious injuries. Pleasingly, in 2022 there were no fatalities or serious injuries.
- **Supply chains** have also been impacted by labour shortages, competing demand, natural disasters and geopolitics, including the Russia-Ukraine conflict.
- The minerals industry is a particular focus of calls for **transparency** on the flow of financial benefits from the industry, including through taxation.

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OUR MATERIAL TOPICS

Alumina's materiality assessment is guided principally by the Global Reporting Initiatives Standards 2016 (GRI). The assessment was recently updated based on desktop analysis and Alcoa's own 2022 materiality assessments of its bauxite and alumina divisions. Alcoa's triennial comprehensive material update was completed for its 2022 Sustainability Report. With the endorsement of the Alumina Executive team and Sustainability Committee, these topics (shown in the table to the right) form the basis for this report.

All the topics in the table to the right are material for AWAC. In the 'AWAC' section of this report (page 42), we describe how Alcoa manages these topics, and 2022 performance. These topics are also the subject of engagement between Alumina and Alcoa, described on page 16.

We have indicated with an △ symbol those topics that are material to Alumina Limited itself. In the 'Alumina' section of this report (page 14 to 20), we describe how Alumina manages these topics in respect of our own operations.

As part of our last materiality assessment, we mapped the material topics to the SDGs, applying two lenses: linkage between the material topics and the SDG targets; and a qualitative assessment of potential positive and negative impacts of our operations on the SDGs. The goals identified are included in the table to the right and continue to provide context for our activities and ambition.

The definition and boundaries of our material topics are outlined on the material topics tab of the Data Pack located on the Company website.

	IMPORTANCE TO ALUMINA LIMITED AND STAKEHOLDERS			
MATERIAL TOPICS	HIGH	MEDIUM	LOW	UNITED NATIONS SUSTAINABILITY DEVELOPMENT GOALS (SDGS) LINKAGE
Environment	Impoundment Management Climate Change Biodiversity and Mine Rehabilitation Water Stewardship	Energy Use and Efficiency		6, 7, 9, 12, 13, 14, 15
Social	Safety and Health Human Rights Local Commitment with Communities Indigenous and Land Connected People	Economic Contribution and Tax Transparency △ Diversity and Inclusion △ Workforce Inclusion, Diversity and Equity Talent Attraction, Retention and Development	Executive Remuneration △	3, 4, 5, 6, 8, 10, 15, 16, 17
Governance	Business Integrity △ Ethics and Good Governance ESG Transparency and Disclosure	Government Compliance and Engagement △ Industry Relations △ Supply Chain Management		8, 10, 12, 16, 17

MATERIAL TOPICS CHANGES

The review of AWAC material topics has identified the following changes:

New material topics:

- **ESG Transparency and Disclosure** – Recognising the increasingly stringent disclosure requirements and the associated expectations from AWAC's external stakeholders

Override material topics – *included on 'Tier 2' in a previous assessment*:

- **Diversity and Inclusion** – Currently referred as Workforce Diversity, Equality and Social Inclusion
- **Supply Chain** – Currently referred as Supply chain management
- **Employee Development and Engagement** – Currently referred as Talent attraction, retention and development

Topics no longer considered material:

- **Air Quality** – Although no longer material to AWAC, this topic remains important for AWAC's management
- **Waste, Tailings and Residue Management** – Relevant matters are integrated into Impoundment Management topic. Other matters are no longer material to AWAC but they remain important for AWAC's management
- **Government Compliance and Engagement** – Relevant matters are integrated into other topics.

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ALUMINA — LIMITED

The following chapters address topics that are material for Alumina itself and describes how we manage them.

GOVERNANCE

Our role is to provide informed guidance to AWAC while protecting the interests of our shareholders and stakeholders. Fulfilling this role well depends on strong and ethical governance practices, supported by an experienced leadership team that is aligned to our values and principles.

As a key topic, governance is addressed across various sections of this report:

- This chapter covers Alumina's governance structures and process, including governance of sustainability.
- The next chapter covers our formal and informal engagement with Alcoa on the governance of AWAC.
- 'AWAC governance' (page 44) details Alcoa's approach to governance, as operator of AWAC.

BOARD OF DIRECTORS

The principal role of Alumina's Board of Directors is to protect and further the interests of its shareholders.

We have a focused Board that bring a relevant combination of functional skills and international experience from the industry.

The Nomination Committee is responsible for the Board's succession planning and, as necessary, nomination of candidates to fill any vacancy on the Board.

Alumina Limited is required to meet its fiduciary obligations to shareholders in respect of its investment in the AWAC JV, and also to meet the expectations of an ASX listed entity. This requires attracting and retaining directors with appropriate experience, expertise and skills.

ALUMINA BOARD STRUCTURE

Board of Directors

Audit and Risk Management Committee	Nomination Committee
Compensation Committee	Sustainability Committee

Throughout 2022, the Board of Alumina Limited consisted of five Non-Executive Directors and the CEO. In 2022, women represented 40% of the Non-Executive Directors and approximately 33% of the total Board.

Directors of Alumina Limited undertake training to stay current on business, industry trends, key dynamics and ESG matters. In 2022, training was conducted on climate change matters including climate change and ESG trends, international policy developments, biodiversity, permitting, Board responsibility for climate change, decarbonisation solutions, impoundment standards and compliance, and modern slavery and human rights.

In late 2022 the Board undertook a self-assessment process of its performance over the year. The process allows us to evaluate the performance of the Board, its committees and individual directors each year.

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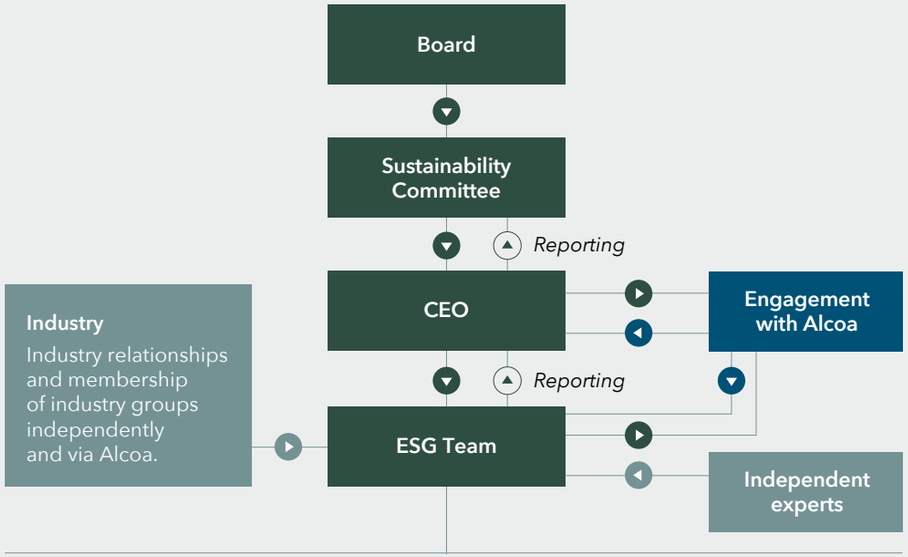
GOVERNANCE OF SUSTAINABILITY

Our Board has ultimate responsibility over all sustainability matters at Alumina. In 2020 Alumina's sustainability governance and strategy was strengthened by the formation of a Sustainability Committee of the Board. All members of the Board sit on this committee, except for Mr Michael Ferraro. Mr Ferraro is Managing Director and CEO and is not a member of the Committees of the Board. However, he may attend in his capacity as CEO.

Sustainability governance structure



Governance and reporting

Management accountabilities. Reporting including internal reporting, sustainability reporting, TCFD, accounting (AASB/SASB), training, safety, community, indigenous peoples.

Metrics and targets

Including assessment, analysis & suitability (quantitative and qualitative).

Risk management

Including sustainability materiality assessment, sustainability risk identification & assessment, mitigation, management & monitoring.

Strategy

Including sustainability roadmap, business impact, opportunities & investment e.g. assessing energy and GHG abatement options/opportunities such as hydrogen.

The Sustainability Committee Charter sets out the roles and responsibilities of the committee. It meets at least quarterly to discuss and provide recommendations to the Board on ESG issues including, but not limited to, climate change, health and safety, environment, and social and community matters, as well as relevant feedback received from stakeholder engagement. 'Alumina's stakeholder' (page 11) details how we engage with stakeholders.

The Sustainability Committee met four times during 2022, and discussed matters relating to the material topics included in the Sustainability Update. Discussions included emissions, climate-change strategy, TCFD, water management, and Biodiversity.

Our other Board Committees also consider ESG matters where relevant: for example, the Audit and Risk Management Committee assesses potential sustainability risks and opportunities for shareholders through the Risk Management Framework.

Executive-level responsibility for sustainability topics sits with our CEO, who is briefed monthly on key metrics and current issues. The multi-disciplined ESG team is comprised of four members and is led by our General Counsel.

BUSINESS INTEGRITY

Why this matters

Alumina's reputation and social licence to operate depends on maintaining transparency and acting in accordance with our values.

How we manage this

In all our actions and operations, we recognise the importance of ethics and transparency. This includes the disclosure of associated processes, performance and business risks to shareholders.

Our values of Respect, Integrity, Honesty, Personal Commitment, and High Performance underpin all that we do. Our values can be found on our website www.aluminalimited.com/code-of-conduct

Alumina's policies, strategies and codes provide the framework for us to translate our values into practice. These include policies in relation to ethics, sustainability topics and Board performance, all of which can be found on our website.

Alumina has a whistleblower policy which outlines the process by which people can report any illegal, unethical or improper conduct, and the protections (including statutory legal protections) from any reprisal or detrimental action that are available to whistleblowers. Refer to www.aluminalimited.com/whistleblower-policy/

INDUSTRY RELATIONS

Why this matters

Industry associations provide a critical forum for dialogue and influence towards a sustainable, resilient aluminium, alumina and bauxite industry. Membership of these associations helps Alumina to drive collaboration and engagement on issues important to the aluminium and mining industries.

How we manage this

Alumina is a member of, or participates in, the following organisations:

- Aluminium Stewardship Initiative (General Supporter)
- Australian Aluminium Council*
- International Aluminium Institute
- Manufacturing Australia.

Membership of these organisations helps us to expand and challenge our thinking through exposure to other organisations' views and approaches to a broad range of issues, including ESG matters.

* Mike Ferraro, Alumina Limited's CEO, is the President of AAC.

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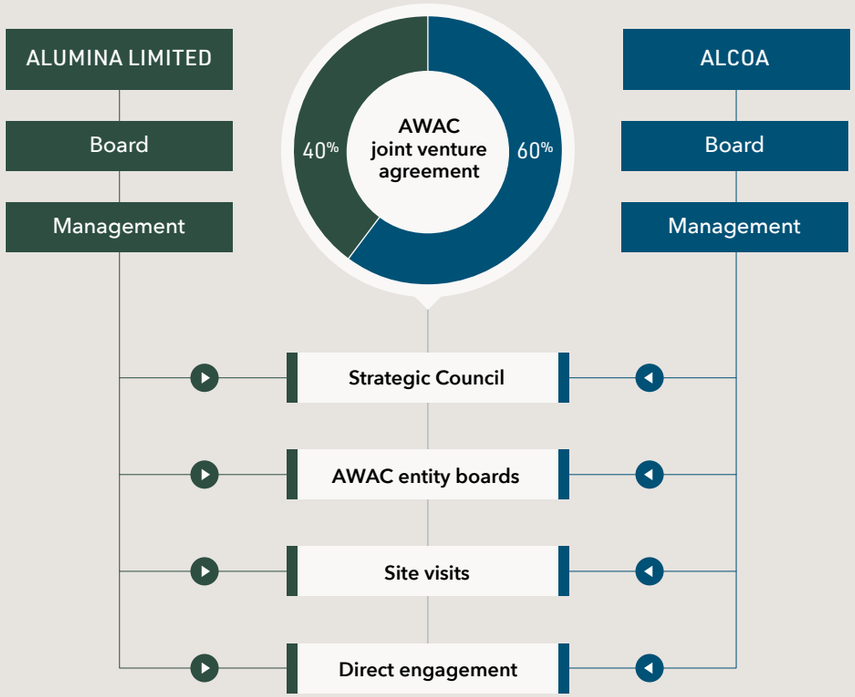
HOW WE ENGAGE WITH ALCOA AND AWAC

As a joint venture partner, Alumina shares in both the successes and challenges faced by AWAC, but as a non-operator we do not control AWAC's performance. Our engagement with our partner Alcoa is our sole means of managing the risks and opportunities at AWAC for the benefit of Alumina's shareholders.

Alumina engages with Alcoa and AWAC via several formal and informal channels throughout the year, as outlined in the diagram below.



GOVERNMENT COMPLIANCE AND ENGAGEMENT

Why this matters

As AWAC's operations cover a broad range of legal, regulatory and political systems, it is essential that Alumina remain abreast of relevant regulations.

How we manage this

We seek to inform discussion around the regulation of our industry through participation in industry associations, with a focus on energy and greenhouse gas policies.

Our participation in industry associations helps us to stay abreast of changes to regulation and policy within our industry. They are also our primary channel for informing discussion around the regulation of our industry, with a focus on energy and greenhouse gas policies.

The Appendix 4G, lodged by Alumina Limited with the ASX, sets out the extent of Alumina's compliance with the ASX Corporate Governance Council's Corporate Governance Principles and Recommendations (4th Edition) and specifies where relevant corporate governance disclosures can be found in the 2022 Alumina Limited Corporate Governance Statement.

There were no known instances of non-compliance with laws and regulation during the reporting period applicable to Alumina Limited.

Alumina is not required to report under the *Modern Slavery Act 2018*; however, Alcoa of Australia annually submits a statement (see further on Alcoa of Australia 2022 Modern Slavery Statement).

In line with Alumina's Code of Conduct and Anti-Corruption Policy, Alumina does not donate to any political party or aligned interest group.

AWAC compliance sits with Alcoa as the AWAC operator (see page 44). The primary mechanism for Alumina to oversee and monitor AWAC compliance is through our participation in the boards of the AWAC entities and via the Strategic Council.

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STRATEGIC COUNCIL

The Strategic Council is the principal forum for Alcoa and Alumina Limited to provide direction and counsel to the AWAC entities in respect of strategic and policy matters. The Strategic Council has five members, three appointed by Alcoa (of which one is the Chairman) and two by Alumina Limited (of which one is the Deputy Chairman). Decisions are made by majority vote except for matters which require a 'super-majority' vote, which is a vote of at least 80% of the members. A full description of Alumina Limited's strategy and business model is included in the Operating and Financial Review on pages 20-41 of the 2022 Annual Report.

ALCOA		ALUMINA LIMITED	
Position	**Held in 2022 by**	**Position**	**Held in 2022 by**
Chief Executive Officer	Roy Harvey (Chair)	**Chief Executive Officer**	Mike Ferraro (Deputy Chair)
Chief Financial Officer	William Oplinger	**Chief Financial Officer**	Grant Dempsey (January 2022) Galina Kraeva (February 2022 onwards)
Chief Operating Officer	John Slaven		

The Council meets semi-annually and acts as a consultative forum more than a decision-making body. Discussion focuses on substantive questions of strategy or policy (for example investment and divestment). As the operator, Alcoa is responsible for communicating, delegating and following up on actions resulting from Strategic Council meetings.

Agenda items can be put forward by either party; in 2022, two Strategic Council meetings were held, and environmental, social and governance (ESG), Compliance, Operations, Markets, Strategy, Financial and Safety topics were discussed.

AWAC ENTITY REPRESENTATION

Alumina is entitled to representation in proportion to its ownership interest on the board of each entity in the AWAC structure and is currently represented on the boards of Alcoa of Australia Ltd (AofA), AWA Saudi Limited and Alcoa World Alumina LLC (AWA LLC). Each board generally comprises two Alumina and three Alcoa members; we are represented by our CEO and CFO.

Alumina participates in quarterly meetings of the Alcoa of Australia board, discussing entity-level performance, and governance and compliance matters including risk management and ESG topics. Similarly, we attend annual meetings of the board of Alcoa World Alumina Brasil.

SITE VISITS

Alumina normally aims to send representatives to a selection of AWAC operations on an annual basis to engage with site management, review operations and hold meetings with representatives of local communities. These visits help us build relationships with key managers and to deepen our understanding of operations. Alumina Limited employees visited various sites in 2022.

DIRECT ENGAGEMENT

In addition to the mechanisms above, Alumina engages directly with Alcoa through various formal and informal channels:

- A monthly meeting with the Alcoa Chief Operations Officer, attended by management from both organisations. These meetings have a strong focus on operations, and cover ESG topics including environmental impacts and health and safety. They are primarily an opportunity for Alumina to gather information and ask questions.
- A quarterly meeting with Alcoa's Chief Commercial Officer, attended by Alumina Limited management. These meetings focus on the sale of our commodities, and the cost of key inputs (chiefly caustic soda and energy). These discussions also are primarily an opportunity for Alumina to gather information and inform our view of markets, risks and exposures.
- Alumina's ESG Team meet quarterly with senior Alcoa sustainability representatives. The standing agenda for this meeting includes tracking key metrics and strategies for our material topics, climate plans and actions, and any common questions in relation to sustainability issues.
- The CEO of Alumina speaks regularly with the CEOs of Alcoa Corporation and Alcoa of Australia to discuss current topics.
- Issue-specific engagement directly between the most relevant personnel from each organisation, including on sustainability. When occasional opportunity has arisen, members of the Boards of Alumina and Alcoa have met in informal settings to understand one another's perspectives on a shareholder to shareholder basis.

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OUR APPROACH TO SUSTAINABILITY

As part of a non-operating role in the joint venture, Alumina Limited has filled a support role to Alcoa in managing AWAC to focus on best practice in environment, safety, community and financial performance through strong, collaborative and informed governance.

This has been achieved through:

- reviewing and discussing AWAC's long-term sustainability strategies and objectives with managing partner Alcoa
- supporting the sustainability policies and practices that Alcoa implement in AWAC to ensure sustainable operations
- working towards meeting international best practice in sustainability reporting.

Aluminium is pivotal to a decarbonised world AWAC aims to meet growing demand by providing the market with low carbon alumina.*

Aluminium has a key role to play in the transition to a low-carbon, circular economy. It is lightweight, ductile, malleable and conductive, with a corrosive-resistant oxide layer. Its applications are numerous, from construction and transport through to electricity transmission, and it is infinitely recyclable. These characteristics have always led aluminium to be held in high regard with consumers and will drive increased demand as the economy decarbonises.

In the medium to long term Alumina anticipates increased demand for aluminium as a requirement to produce clean energy technologies from solar panels and wind turbines to electric vehicles. At the same time, the market will increasingly be looking for sustainably sourced aluminium. AWAC is well placed to meet that demand, with a strong commitment to ESG management, combined with a focus on the future and innovation. AWAC's assets are highly competitive on key sustainability measures including emissions, biodiversity management, community impact and safety.

To take the next step in the decarbonisation of alumina and aluminium, and actively compete in this growing market, AWAC needs to solve a number of technology and green energy challenges. In response, AWAC is investing in research and development.

Alumina engages with AWAC on all its material sustainability topics (see page 16).

Areas of particular focus where we have conducted independent research include decarbonisation, climate risk and tailings facilities.

Decarbonisation

Why this matters

The world is undergoing a transition to a lower carbon economy. This transition has increased in its momentum during 2022.

Aluminium will be a vital metal in that transition due to its lightweight, recyclable and durable nature. Increasingly, we expect to see the role of aluminium move to the forefront of the decarbonisation discussion.

How we manage this

Alumina's Climate Change Position Statement outlines its aim to support AWAC transition to a low carbon economy, which includes:

- Work with the AWAC joint venture, and strive for AWAC to reduce its direct and indirect emissions (Scope 1 and 2) by 45% by 2030 (from a 2010 baseline), and to net zero by 2050. As at 2022, AWAC has reduced its emissions by 47%, exceeding Alumina Limited's 2030 target.
- Work with Alcoa to identify and assess climate change risks, adapt to changing climate risk and seize opportunities across AWAC to produce shareholder value. Due to the energy- and carbon-intensive nature of our operations, securing low-cost, low-environmental-impact and long-term energy is a focal point of our energy strategy, with the aim to minimise impacts and maximise value.
- Work towards aligning disclosures to the recommendations of the TCFD, to aid in providing information to investors and other stakeholders.
- Explore how an internal carbon price could be used in our investment projects and strategic decision-making processes to help to prepare our business for regulatory changes.
- Work on developing climate change scenario analysis to assess our future risks in the face of uncertainty. This would include stress testing scenarios such as '2 degrees' and 'beyond 2 degrees,' to help us understand the risks to our assets, operations and supply chains.

Climate change risk

Why this matters

Climate change is a systemic and material risk that will pose challenges in the future management of AWAC operations regarding energy usage, GHG emissions, carbon pricing policies and regulations and market demand. Additionally, the impacts of climate change will create a number of physical risks that AWAC will need to manage. However, decarbonisation presents significant opportunities for AWAC.

How we manage this

Please refer to Alumina Limited's approach to Climate Change Position Statement and Net Zero Statement. See page 21.

Tailings

Why this matters

AWAC's operations generate hazardous waste which is contained in tailing facilities, residue storage areas and other impoundments. The responsible management of tailings facilities continues to be a focus for our investors and other stakeholders, following major incidents involving other mining operators in recent years. Mismanagement of tailings facilities or unanticipated structural failure or over-topping caused by extreme weather events could result in injury or loss of life, damage to the environment or property, which in turn pose a reputational and financial risks for Alumina, even as the non-operator. This risk applies to both operational sites and those in closure.

How we manage this

Our executive team and Board take seriously their due diligence responsibilities in relation to tailings. Tailings dam safety management is a standing agenda item for each Alumina board meeting.

Alumina engages third-party experts to conduct detailed technical and management system reviews on an ongoing basis.

This independent analysis informs our engagement with Alcoa at the Strategic Council and other forums (see page 16), enabling us to provide challenge and guidance.

In response to the Investor Mining and Tailings Safety Initiative, a listing of AWAC impoundments can be found on the Alcoa and Alumina Limited websites.

* AWAC's EcoSource brand provides low-carbon SGA and certain NMA, which have no more than 0.6 metric tonnes of CO_2e per metric tonne of alumina.

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SOCIAL

The Alumina team is small but encompasses a mix of diverse experience and viewpoints. This unique package of skills enables us to bring robust oversight and challenge to the AWAC joint venture.

THE ALUMINA LIMITED TEAM

Our small team of 15 employees combines insight from a range of backgrounds to provide informed oversight of AWAC. This includes an understanding of markets, unique insight into business strategy, sustainability understanding, and a combination of legal, financial and regulatory expertise. Given the central importance of our relationship with our joint venture partner, communication skills are also critical.

	FEMALE	MALE	TOTAL
Full-time employees	3.5	8.3	11.9
Part-time employees	0.6	2.0	2.6
Permanent full-time equivalent (FTE)	4.1	10.4	14.5
Contractor	0.0	0.0	0.0

Our team are well informed, with a high degree of shared knowledge about the aluminium market and AWAC's business operations. Employees are encouraged to make creative, innovative and meaningful contribution to the business. Given our small size, we have a relatively informal culture and structure, in which all employees have access to the leadership team and exposure to the Board. We aim to cultivate an open and collaborative working environment, which helps keep our turnover low.

All employees are required annually to complete training modules in ethics and compliance matters. In 2022, male and female executive and staff members on average completed 7.4 hours of training.

All employees have individually negotiated contracts but retain the right to freely associate and collectively bargain, in line with our Human Rights policy.

We value the wellbeing of our people, as outlined in our Environment Health and Safety Policy. As an office-based business, occupational health and safety incidents are rare. When site visits are required, we conduct advance checks of health and safety requirements and personal safety issues and provide access to emergency assistance. During the reporting period, Alumina reported no work-related injuries or hazards.

ECONOMIC CONTRIBUTION AND TAX TRANSPARENCY

Why this matters

AWAC operations create value in a number of locations around the globe. Transparency about the flow of benefits, including our approach to tax, and amounts paid, is important to maintaining trust and social license to operate.

Economic contribution

In 2022, Alumina Limited recorded a profit after tax of $104.0 million dollars and declared a fully franked dividend of US4.2 cents per share, representing an average dividend yield of 6.5% over the last five years. Profits were impacted by challenging market conditions prevailing globally throughout the year, imposing inflationary pressures for the costs of global energy and raw materials.

Tax transparency

We manage our tax requirements by carefully following our financial and ethical policies and guidelines. For details of Alumina's income tax payments during FY22 please refer to the 2022 Annual Report, page 68. We monitor AWAC tax payments primarily through our participation in the boards of the AWAC entities (see page 17).

As previously reported, the Australian Taxation Office (ATO) has undertaken a transfer pricing examination in respect of certain historical third-party alumina sales made by Alcoa of Australia Limited over a 20-year period. The results and implications of this examination are discussed in the Alumina Limited 2022 Annual Report in note 2(d).

DISTRIBUTION OF ALUMINA LIMITED ECONOMIC CONTRIBUTION 2022

Dividends paid
$203.1M 47.3%

Net finance costs paid
$4.1M 1%

Employee benefits
$5.9M 1.4%

Payments to suppliers
$4.6M 1.1%

Contributions for investments in associations
$212.1M 49.3%

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DIVERSITY AND INCLUSION

Why this matters

To effectively fulfill our role of bringing robust challenge to the AWAC JV, we need access to diverse viewpoints, and that means having diversity in our board and employees.

How we manage this

Alumina Limited's Diversity Policy sets out measurable objectives to create a workplace that promotes and supports equal opportunity, diversity and inclusion across a range of dimensions. It focuses on recruitment and provision of work/life balance as well as board diversity.

Alumina Limited's current diversity objectives are:

CURRENT OBJECTIVES	RESULT
1. Engage consultants who support and promote the Company's diversity policy, including assisting to identify additional suitably qualified external female candidates	Achieved throughout 2022
2. Ensure that candidate lists for permanent employee positions are recognisably diverse by age, sex or ethnicity	Achieved throughout 2022
3. Ensure that in the interview process for each executive position (i.e., CEO level, immediate management level below CEO) there is at least an equal number of appropriately qualified female and male candidates, and at least an equal number or majority of female on the interview panel	Achieved throughout 2022
4. Consider diversity when reviewing Board succession plans with the aim to improve gender representation and diversity	Achieved throughout 2022
5. Adopt a target of 40:40:20 for the Company's Board of Directors (minimum of 40% male and 40% female respectively), recognising the limits posed by a small sized Board	Achieved throughout 2022
6. Develop flexible and part-time work arrangements where employees can balance work-life commitments and pursue career development	Achieved throughout 2022
7. Aim to maintain scores for employee engagement for identified groups that are not less than the whole-of-company engagement scores	Achieved throughout 2022
8. Implement leadership programs that assist in the development of a diverse pool of skilled and experienced employees, and that prepare them for senior management	Achieved throughout 2022

Although we have achieved these objectives, our diversity is constrained in practice due to our small size, low turnover, and operating in a historically male-dominated industry. For 2022, 28% of Alumina Limited's fifteen employees were women, an improvement of 4% from the previous year. Further information about Board composition can be found on page 14.

EXECUTIVE REMUNERATION

Why this matters

Remuneration is an important factor in helping us to attract and retain the right executive talent to contribute to Alumina's success and incentivise our team to deliver strong performance in line with our values.

How we manage this

Our remuneration structures are designed to reflect the unique nature of the company as a non-operator, the role of the management team in the joint venture and their focus on long-term value creation for shareholders. These structures also make provision for the cyclical nature of this capital-intensive industry, where the underlying price of alumina is a direct determinant of performance. The process for determining remuneration, and stakeholder involvement in the remuneration process, can be found in further detail in Alumina's 2022 Remuneration Report, which is located on pages 42 to 65 of Alumina Limited's 2022 Annual Report.

The FY22 Remuneration Report also reviews Alumina's remuneration strategy, policy and outcomes, including full details of the CEO and Senior Executives' objectives, and an assessment of performance against those objectives.

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ALUMINA LIMITED'S APPROACH TO CLIMATE CHANGE RISKS AND OPPORTUNITIES

INTRODUCTION

Alumina Limited, through its interest in AWAC, an energy and emissions-intensive business, has a role to play in seeking to reduce emissions and build resilience to climate change impacts. As a listed company, we also believe that we have an obligation to stakeholders to continuously improve our disclosures in respect of climate change, and to actively work within the AWAC joint venture to reduce AWAC's carbon footprint.

Alumina Limited has been an early promoter of carbon disclosures. Alumina Limited commenced reporting on sustainability performance in 2008 and issued its first sustainability update informed by GRI standards in 2011. Alumina Limited first participated in the Carbon Disclosure Project (CDP) in 2010. As ESG issues have evolved, and stakeholders have become more sophisticated, Alumina Limited has focussed on improving its sustainability disclosures.

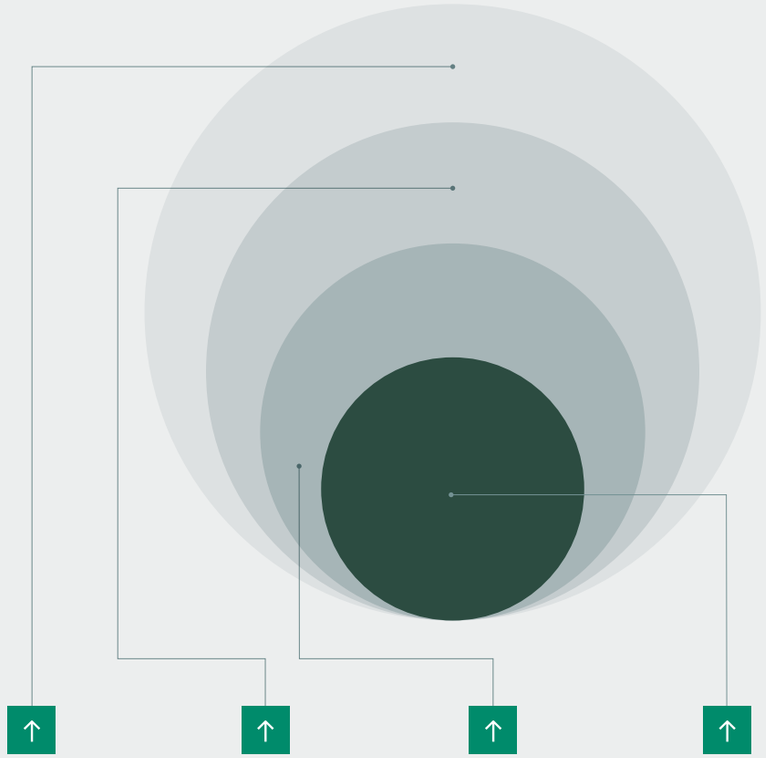
In 2017, the TCFD released disclosure recommendations to support stakeholders in making informed, and efficient-capital allocation decisions. It is recommended that TCFD disclosures are provided for the Governance, Strategy, Risk Management and Metrics & Targets Core Elements.

DISCLAIMER

These TCFD disclosures have been prepared by Alumina Limited as a guide to the possible effect of climate-change on the joint venture. This section may contain forward-looking statements, and should be read in conjunction with the Disclaimer on page 63 of the Sustainability Update. Any forward-looking statements contained in this Sustainability Update are not guarantees of future performance.

There may be future events that we have discussed that may not eventuate, and there may be events that we have not anticipated or disclosed in this report.

CORE ELEMENTS OF RECOMMENDED CLIMATE-RELATED FINANCIAL DISCLOSURES



Governance

The organisation's governance around climate-related risks and opportunities.

Strategy

The actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning.

Risk Management

The process used by the organisation to identity, assess, and manage climate-related risks.

Metrics and Targets

The metrics and targets used to assess and manage relevant climate-related risks and opportunities.

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THE CURRENT PORTFOLIO OF ASSETS

Below is a summary of AWAC key assets. AWAC's most significant business is the process and sale of aluminium oxide, known as alumina. This represents the lion's share of AWAC's revenue, as well as approximately 72% of the total emissions of the portfolio. Hence, a major focus of this report is the decarbonisation of AWAC's alumina business, and to a lesser extent AWAC's aluminium business.

	BAUXITE MINING	ALUMINA REFINING	ALUMINIUM SMELTING
Assets/Energy Within scope of this disclosure (100% ownership within AWAC, unless noted)	**Australia** Huntly, Willowdale (Diesel) **Brazil** Juruti (Diesel)	**Australia** Pinjarra, Kwinana and Wagerup (Natural gas) **Brazil** Alumar, 39.96% ownership (Fuel oil and coal) **Spain** San Ciprian (Natural gas)	**Australia** Portland, 55% ownership (Electricity, primarily sourced from brown coal, but transitioning to renewables. Natural gas used in the production of carbon anodes)
Production 2022 (Mt)	36.3 million bone dry tonnes of bauxite The majority of this is sold internally and converted into alumina	11.8 million tonnes of alumina Includes smelter grade alumina and non-metallurgical alumina	0.159 million tonnes of aluminium
Emissions 2022 (Mt)	0.3 Mt of CO_2e (equity basis) 4% of total Scope 1 & 2 emissions	6.0 Mt of CO_2e Mt (equity basis) 72% of total Scope 1 & 2 emissions 7.2 Mt of CO_2e Mt (full facility basis)	2.1 Mt of CO_2e Mt (equity basis) 24% of total Scope 1 & 2 emissions 3.7 Mt of CO_2e Mt (full facility basis)
Energy consumption 2022 (Gj/tonne of production)	0.09	9.07	56.85
Sales 2022	US$0.165 billion 3rd party sales, inclusive of freight.	US$4.6 billion Includes sales to AWAC's share of the Portland Smelter.	US$0.5 billion
Assets outside of scope (and AWAC ownership %)	**Non-operated JVs** MRN (Brazil), 9.62%[1] CBG (Guinea), 22.95% Ma'aden (Saudi Arabia), 25.1%	**Non-operated JVs** Ma'aden (Saudi Arabia), 25.1%	
Process description	Mining generates a relatively modest level of emissions. The main source of emissions is the consumption of diesel fuel for haul trucks and equipment, and electricity for mine sites. AWAC's mines generally have a low amount of top soil and overburden between the surface and the ore body, and therefore requiring less energy for extraction.	Bauxite is converted into alumina (aluminium oxide) through the Bayer process. Emissions are created during the digestion (~70% of emissions) and calcination (~30% of emissions) processes. For the digestion process, energy (from any source) is required to generate steam (between ~150-250 degrees Celsius, depending on bauxite quality and other factors). For calcination, energy is required to create heat at ~1,000 degrees Celsius to dry the alumina hydrate. Some electricity is also used for the plant and equipment on site, as well as administrative offices.	Alumina is converted into aluminium through the Hall–Héroult process. Emissions come from the chemical reaction (anode preparation and consumption) and the electricity used to create current for the reaction. Smelters that use exclusively renewable electricity will have a lower carbon footprint than smelters than rely on electricity generated from fossil fuels.

1. The AWAC interest in the MRN bauxite mine in Brazil was divested during H1 2022.

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A HIGHER QUALITY PORTFOLIO SIGNIFICANTLY REDUCES EMISSIONS

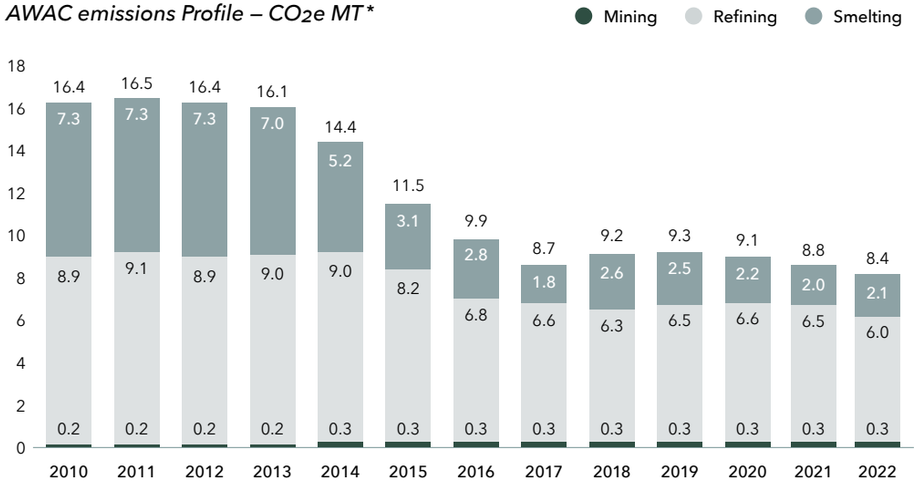
Since 2010 AWAC has sought to improve the quality of its portfolio of assets and reduce its reliance on coal and oil as an energy source.

This has enabled AWAC to achieve significant reductions in its carbon emissions. A number of less competitive assets reliant on high emission fuels were closed or curtailed in the middle of the last decade as the commodity cycle moved against aluminium and its main inputs, alumina and bauxite.

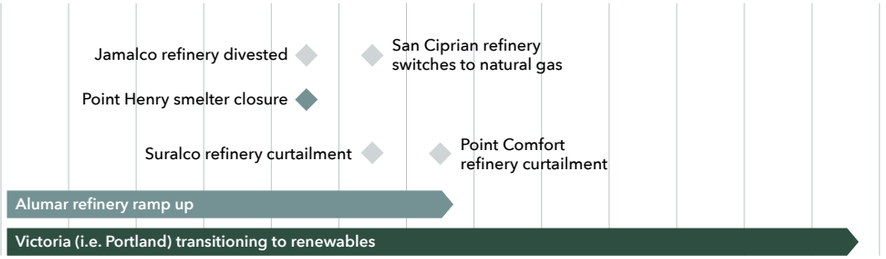
The Point Henry smelter and its associated Anglesea coal-fired power station were closed, reducing consumption of electricity generated from brown coal, and the Suralco and Point Comfort refineries were curtailed and later closed, reducing consumption of fuel oil and natural gas respectively. In 2010, AWAC's most inefficient assets contributed relatively more to its total portfolio emissions. Reducing the output of these assets has resulted in highly significant reduction of emissions over the current portfolio, and improved financial performance owing to the better energy efficiency and greater competitiveness of the remaining core assets.

AWAC's historical emissions

*AWAC emissions Profile – CO_2e MT**

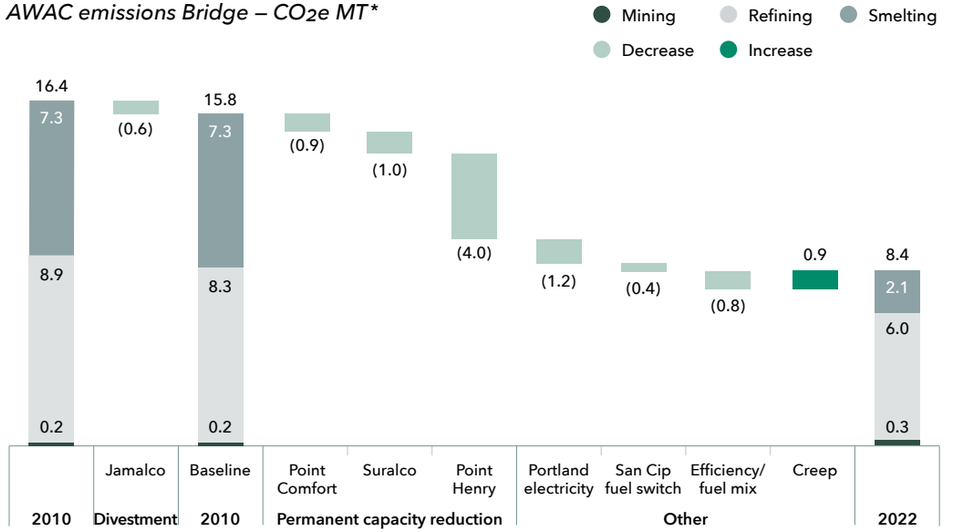


Event timeline:



Divestments, fuel substitution, renewals uptake and general efficiencies contribute

*AWAC emissions Bridge – CO_2e MT**



* Scope 1 & 2 emissions. AWAC's equity share of facilities.

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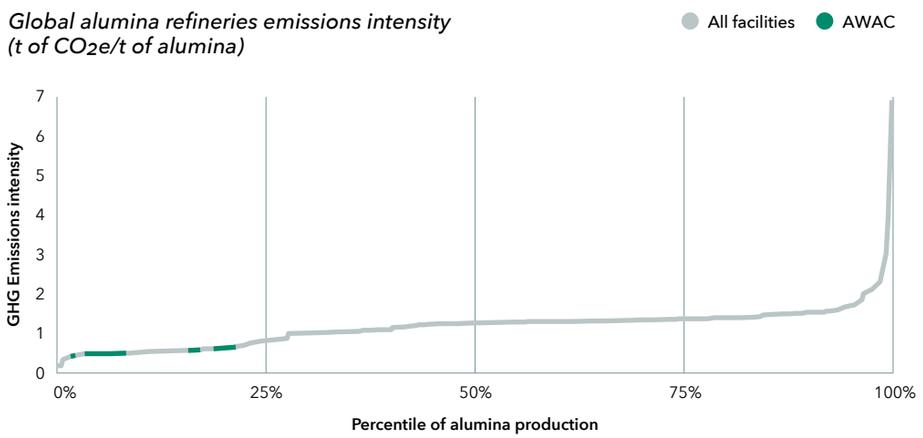
REFINING EMISSIONS ADVANTAGE

AWAC's portfolio of refineries represents one of the lowest global emissions intensities in the first quartile of alumina refineries globally. AWAC has a credible plan to maintain its advantage in emissions intensity.

Global alumina refineries emissions intensity (t of CO_2e/t of alumina)

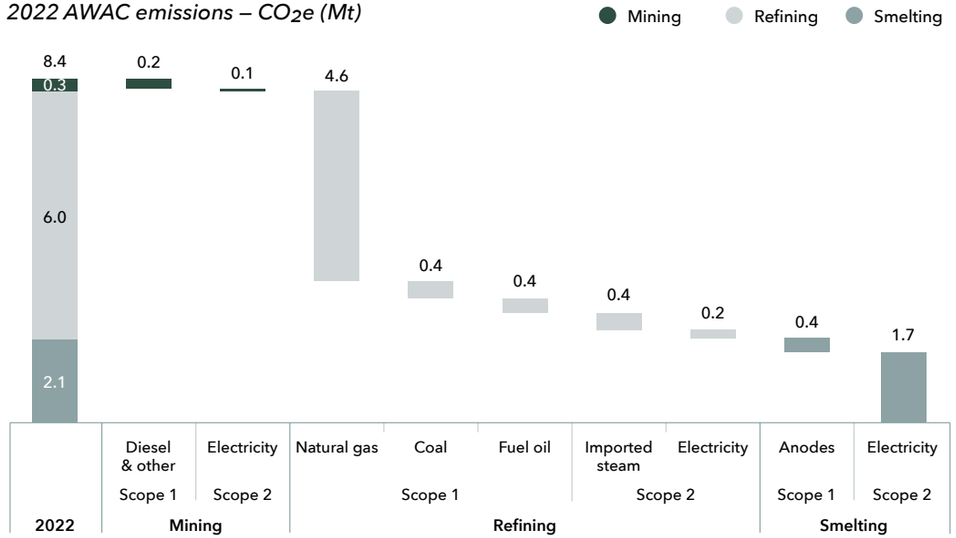


Source: CRU, April 2023.

APPROXIMATE SOURCE OF AWAC'S SCOPE 1 AND 2 EMISSIONS

The chart shows the approximate source of AWAC's emissions by activity and fuel source.

2022 AWAC emissions – CO_2e (Mt)



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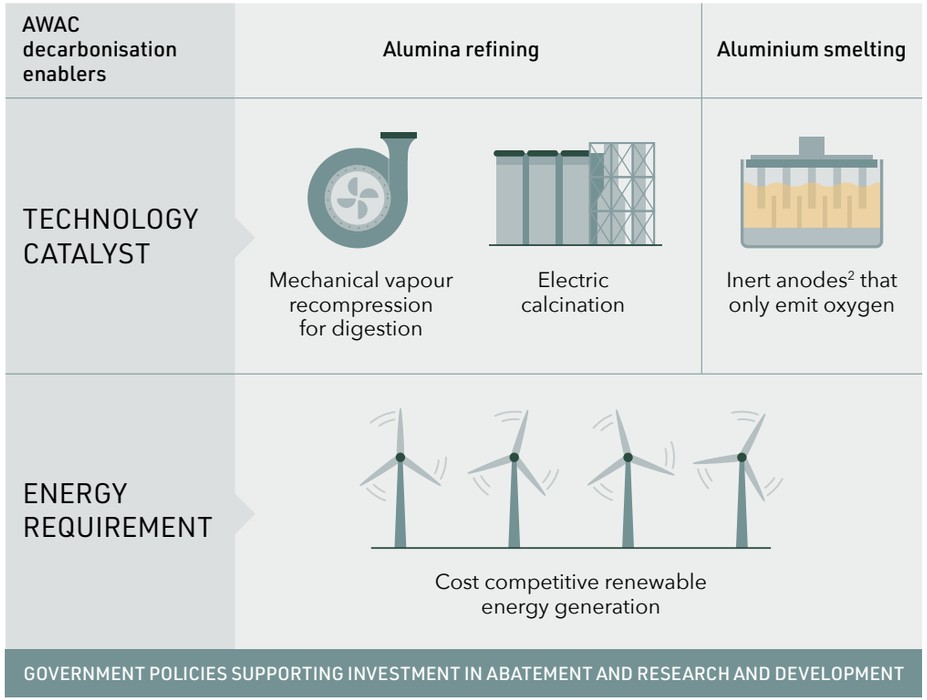
DECARBONISATION STRATEGY

AWAC's indicative decarbonisation roadmap.



Alumina Limited has announced that it will, through working with the AWAC joint venture, strive for AWAC to reduce its direct and indirect emission (Scope 1 and 2) by 45% by 2030 from a 2010 baseline, and to net zero by 2050.

AWAC's ability to reach net zero is contingent on certain factors, including:

- Advancements in technologies to commercial viability, such as Mechanical Vapour Recompression (MVR) and Electric Calcination (EC) which AWAC is evaluating;
- The ability of AWAC's aluminium smelter to use inert anode technology, such as ELYSIS which our JV partner Alcoa is developing with its partners;
- The availability of cost competitive renewable energy generation, which will be required to power new technologies and displace fossil fuels; and
- Government policy settings that support investment in decarbonisation and options to offset remaining emissions.

Alumina refining

To facilitate the decarbonisation of AWAC's refineries, AWAC is conducting research and development on two particular types of technology, MVR and EC. These technologies have not been applied to an alumina refinery, and will require investment this decade to prove their capability and commerciality. If MVR is able to be retrofitted to our refineries, then it will provide AWAC with a number of advantages. These include improved energy efficiency, reduced water usage (eliminates up to 35% of freshwater use), and the ability for digestion to be emissions free if the electricity is contracted with a green power purchase agreement. MVR is also able to capture and recycle the waste steam from EC, saving 100% of the water content from the original feedstock.

AWAC's refineries could also reduce emissions through actions such as fuel switches, electric boilers, or green hydrogen. AWAC's mining fleet could reduce emissions through electrification using battery storage or green hydrogen.

AWAC is already the lowest emitter of CO_2e emissions amongst major alumina producers, averaging ~0.510 tonnes of CO_2e per tonne of alumina. The future focus is on remaining low on the global emissions curve through technologies such as MVR and EC.

Energy

AWAC's refineries predominantly use natural gas, whilst the Portland smelter utilises electricity from the Victorian electricity grid.

To realise the emissions benefits of MVR and EC, they will need to be powered by green electricity, increasing AWAC's demand in the jurisdictions where its assets are located. This will require continued investment from generators and governments in low-cost renewable generation technology.

Safeguard Mechanism

In 2022, the Australian government proposed reforms to its Safeguard Mechanism, intending to gradually reduce industrial sector emissions baselines to help Australia to achieve its climate targets. The Safeguard Mechanism proposes a range of options to help facilities meet compliance obligations, ensuring businesses are not competitively disadvantaged. This includes crediting, trading and tailored treatment for emissions-intensive, trade-exposed (EITEs) facilities.

Alumina Limited continues to actively engage with government and industry bodies to understand the potential impact that the changes in legislation will have on operations and to ensure the Safeguard Mechanism is implemented in a manner that enables it to achieve its decarbonisation goals. In our view, any changes to legislation need to be conscious of the commercial and technical reality of the aluminium value chain, particularly the three matters that are critical for the industry to achieve its decarbonisation goals:

- Maintaining international competitiveness
- Recognise the timeline for technology readiness
- The transition to renewable energy and existing arrangements (e.g. long-term locked in energy contracts).

2. Inert anode technology is the first industrial process that could emit pure oxygen, and when combined with renewable electricity, produce carbon free aluminium. An example of this is Elysis, which is being developed in a joint venture between Alcoa and Rio Tinto. The process is being ramped up to industrial-sized scale through additional development work.

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Recommendations and supporting recommended disclosures

1. GOVERNANCE

Disclosure the organisation's governance around climate-related risks and opportunities.

RECOMMENDED DISCLOSURES	
1.a	Describe the board's oversight of climate-related risks and opportunities. READ MORE HERE →
1.b	Describe management's role in assessing and managing climate-related risks and opportunities. READ MORE HERE →

2. STRATEGY

Disclosure of the actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning where such information is material.

RECOMMENDED DISCLOSURES	
2.a	Describe the climate-related risks and opportunities the organisation has identified over the short, medium, and long term. READ MORE HERE →
2.b	Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning. READ MORE HERE →
2.c	Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario. READ MORE HERE →

3. RISK MANAGEMENT

Disclosure of how the organisation identifies, assesses, and manages climate-related risks.

RECOMMENDED DISCLOSURES	
3.a	Describe the organisation's processes for identifying and assessing climate-related risks. READ MORE HERE →
3.b	Describe the organisation's processes for managing climate-related risks. READ MORE HERE →
3.c	Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall risk management. READ MORE HERE →

4. METRICS AND TARGETS

Disclosure of the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

RECOMMENDED DISCLOSURES	
4.a	Disclosure of the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process. READ MORE HERE →
4.b	Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks. READ MORE HERE →
4.c	Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets. READ MORE HERE →

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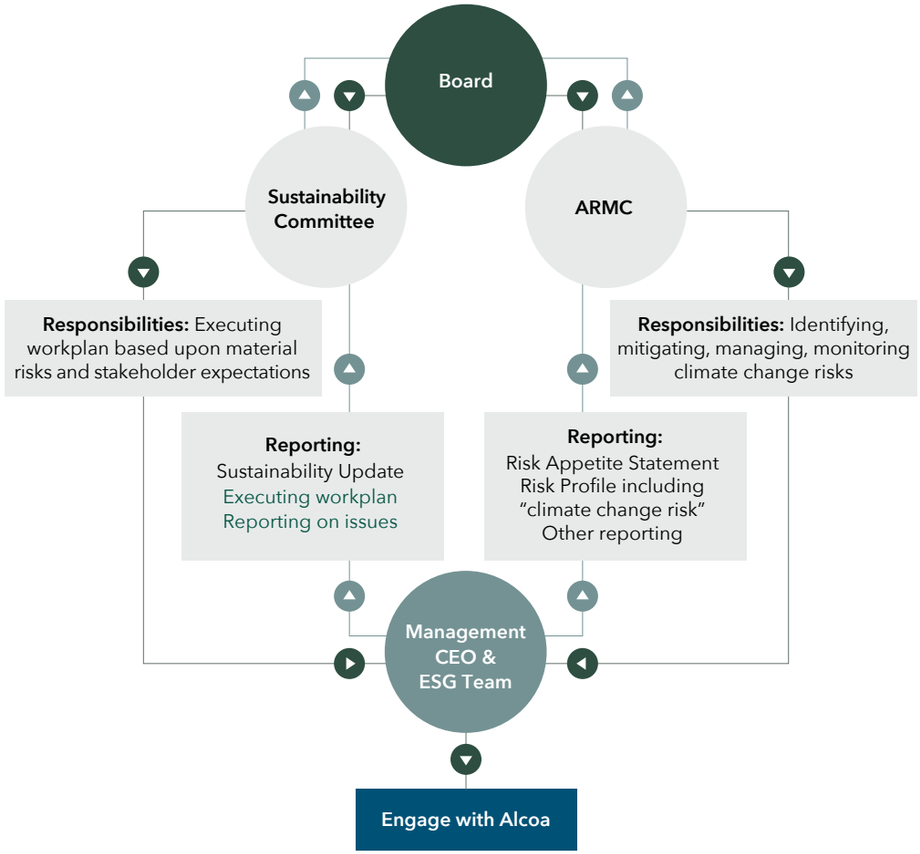
1. GOVERNANCE

1a. The Board's oversight of climate-related risks and opportunities.

Alumina's Board has ultimate responsibility over climate-related risks and opportunities. This responsibility is effectively managed through the Sustainability Committee and the Audit and Risk Management Committee (ARMC). In 2022, the ARMC and the Sustainability Committee met seven and four times, respectively. Currently, all members of the Board are on the ARMC and the Sustainability Committee, except for Mr Michael Ferraro (CEO).

The ARMC oversees management's development of a Risk Management Strategy (RMS) that sets out how they will identify, mitigate, manage and monitor risks. In respect of Climate Change Risk, the CEO and the ESG Team are responsible for developing their RMS. The ESG Team report back to the ARMC through the Risk Appetite Statement (which contains tolerances for certain climate change risks).

The Sustainability Committee oversees management's execution of the workplan, which includes work associated with climate change.



The Board of Directors and the Sustainability Committee

Our Board has ultimate responsibility over all sustainability matters at Alumina Limited and are involved in the development and integration of Alumina Limited's values, policies, and goals. Effective governance is key to driving improvement in any area of business.

The Sustainability Committee Charter sets out the roles and responsibilities of the committee. It meets at least quarterly to assist and provide recommendations to the Board in relation to ESG matters including:

- reviewing and approving relevant sustainability strategies, policies and position statements including on climate change
- considering community, climate change and broader sustainability concerns
- monitoring performance against climate change targets
- reviewing and providing advice on proposed long-term targets and aspirations
- reviewing and approving sustainability reports.

www.aluminalimited.com/sustainability-committee-charter/

The Board of Directors and the Audit and Risk Management Committee

The Board has ultimate responsibility over audit and risk management matters at Alumina Limited. The Audit and Risk Management Committee (ARMC) acts as the delegate of the Board in these matters, which include:

- overseeing and reviewing the Company's risk management framework and the effectiveness of its risk management, by:
  - assessing the Company's exposure to business risks including the strategies in place for managing key risks
  - reviewing and ratifying management's actions in the identification, evaluation, management, monitoring and reporting of material risks
  - monitoring management's performance against the Company's Risk Management Framework (RMF)
  - review any material risk incidents.

Alumina Limited maintains a formal RMF, which is overseen by the ARMC. The RMF contains the following elements:

- Risk management policy, which is approved initially and reviewed annually by the ARMC, as the delegate of the Board of Directors
- Procedural document
- Risk management strategy, which explains how Alumina identifies, mitigates, manages, monitors and reports its material risks
- Risk appetite statement, which contains risk appetite & tolerance statements that are approved and monitored by the ARMC
- Risk profile, which captures the material risks of Alumina, and for each risk provides a description, an allocated risk owner, appropriate risk management strategy, controls, a forward action plan, and an inherent / residual risk rating based on probability and impact of a risk eventuating.

www.aluminalimited.com/audit-risk-committee-charter/

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1b. Management's role in assessing and managing climate-related risks and opportunities.

Alumina Limited's role in the AWAC joint venture

As the non-operating/minor partner, Alumina Limited is restricted to the rights afforded to it under the AWAC joint venture agreements, including in respect of assessing and managing climate-related risks and opportunities.

The joint venture rights are summarised in Alumina Limited's 2022 Annual Report, in the Operating and Financial Review, under the heading "Strategy and business model". www.aluminalimited.com/annual-report/

Under the joint venture agreement, Alumina Limited is entitled to:

- Two out of five members of AWAC's Strategic Council. The Strategic Council is the principal forum for Alcoa and Alumina Limited to provide direction and counsel to the AWAC entities in respect of strategic and policy matters.
- Decisions are made by majority vote except for matters which require a 'super-majority' vote, which is a vote of at least 80% of the members appointed to the Strategic Council.

  Super-majority votes on certain matters, including:

  – Any Expansions, acquisitions, divestitures, closures or curtailments of JV operations likely to result in a change in production exceeding 2 million tonnes per annum of bauxite or 0.5 million tonnes per annum of alumina or which have a sale price, acquisition price or project total capital cost of US$50 million or greater.
- Representatives that sit on the Boards of AWAC operating entities.
- Information requested in accordance with the Information Protocol.

Alumina Limited's role in assessing and managing climate-related risks and opportunities

Within Alumina Limited, the ESG Team is responsible for assessing climate-related risks. The General Counsel is the Risk Owner of the "Climate Change" Risks, and the General Counsel and the CEO are the joint owners of the "ESG" Risk. Alumina Limited's ability to manage climate-related risks is limited to its rights under the joint venture; however, there are frequent formal interactions with Alcoa.

Management is informed and monitors climate-related risks through:

- Independent assessment of climate-related risks assessment, and associated research (including completion of training and attendance at conferences)
- Formal quarterly meetings with representatives from Alcoa's sustainability management to discuss a range of ESG matters, including climate change, and other ad-hoc meetings to discuss specific climate-related topics
- Review of periodic climate-related data (e.g. emissions) from Alcoa and other information requested in respect of specific climate-related issues.

Relevant climate-related information (e.g. The annual sustainability update, and progress against targets) is formally reported by the ESG Team to the Sustainability Committee, and ESG metrics are also reported to the ARMC via the Risk Appetite Statement.

2. STRATEGY

2a. Climate-related risks and opportunities the organisation has identified over the short, medium and long term.

Background to climate-related risk and opportunity assessment

In 2021, Alumina Limited independently conducted a qualitative assessment of climate-related risks and opportunities for our business in alignment with the recommendations of the TCFD. We identified 28 risks and five opportunities and assessed these against three climate change scenarios consistent with RCP (Representative Concentration Pathway) 2.6, RCP 4.5 and RCP 8.5 in the short (2023-24), medium (2025-34) and long term (2035-50).

This scenario-based climate risk analysis represents our initial screening, and provides us with a preliminary understanding of potential climate change impacts in order to help us better manage them.

Following the independent qualitative assessment of climate-related risks and opportunities, in 2022 Alumina Limited undertook the actions necessary to comply in full with elements of the TCFD reporting framework.

Process to determine risks and opportunities

Management's process to identify these risks involved engaging with consultants, internal workshops, scenario testing, reviewing industry and regional studies, climate modelling, and benchmarking of organisations with similar geographies (see further detail under 3a, page 35).

Climate-related risks and opportunities

The following tables present the material inherent (i.e. prior to any adaptation and mitigation actions undertaken by Alumina Limited or AWAC) climate-related risks and opportunities for our business, from Alumina Limited's perspective. Other risks analysed, but deemed to be less material, included those arising from higher annual rainfall, increased intensity and duration of extreme heat, sea level rise and unsuccessful investment, as well as opportunities such as carbon market participation. The impacts shown reflect the most extreme scenario for stress testing purposes. For transition risks and opportunities, this is RCP 2.6 and for physical risks and opportunities this is RCP 8.5. We have not presented RCP 4.5 in the table below as the study did not indicate any notably different impacts from the extreme scenarios, which showed the same directional impacts but to a more pronounced extent.

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Grey circles reflect potential adverse impacts.

The greater the size of the bubble, the greater the potential impact. We will refine these risks as material information comes to our attention.

Physical Risks*

RISK	NAME	DESCRIPTION	SHORT TERM IMPACT	MEDIUM TERM IMPACT	LONG TERM IMPACT
Acute; Chronic	Flooding: tailings & dam design Higher rainfall: tailings & dam design	Increased frequency and severity of extreme precipitation events and higher annual rainfall across some sites (e.g. in South America) may result in more stringent tailings and water dam design criteria which may result in capital expenditure to meet the new criteria	●	●	●
	Flooding: discharge Higher rainfall: discharge	Increased frequency and severity of extreme precipitation events and higher annual rainfall across some sites (e.g. in South America) may cause water management structures to fail resulting in significant capital and operational expenditure as well as lower revenue due to site shut down	●	●	●
Acute	Flooding: dam failure	Increased frequency and severity of extreme precipitation events may cause water management systems to exceed capacity resulting in discharge which may result in additional capital and operational expenditure	●	●	●
	Bushfires: production/logistics delay	Increased frequency and severity of bushfires may cause disruptions resulting in loss of revenue from down time and additional capital and operational expenditure	●	●	●
	Cyclone: production/logistics delay	Increased frequency and severity of high wind events may cause disruptions resulting in loss of revenue from down time and additional operational expenditure	●	●	●
Chronic	Lower rainfall: water stress/quality	Increased average temperatures, lower annual rainfall and increased frequency and period of drought may increase water stress at our water-intensive alumina refining operations which may result in lower revenue due to production ramp downs and additional capital and operational expenditure	●	●	●
	Conflict: water security	Conflict over water resources arising from physical risks of climate change may impact on our social licence to operate	●	●	●

* This analysis was qualitative in nature. The impact is directional and limited to relative magnitude. There are inherent limitations with scenario analysis given it is forward-looking and encompasses many unknowns. This analysis is based on assumptions we made which may or may not prove to be correct. Additionally, there may be factors we have not considered as part of this analysis.

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Grey circles reflect potential adverse impacts.

The greater the size of the bubble, the greater the potential impact. We will refine these risks as material information comes to our attention.

Transition Risks*

RISK	NAME	DESCRIPTION	SHORT TERM IMPACT	MEDIUM TERM IMPACT	LONG TERM IMPACT
Policy and legal	Regulatory standards	Higher standards and increased regulatory scrutiny may impact on our ability to obtain licences and increase operational expenditure			
	Carbon pricing	Exposure to carbon pricing may increase operational expenditure and may result in higher costs for purchased goods and services if passed on by suppliers			
	Policy uncertainty	Policy uncertainty may limit our capacity to prepare for a structured transition resulting in increased costs and disruption to the business			
Market	Material substitution	Materials substitution in key markets (e.g. automotive, construction, packaging, power infrastructure) may have adverse impacts on revenue			
	Substitution of primary production	Decreased demand from substitution of primary production with secondary production			
Technology	Changing customer preferences	Failure to respond to customer preferences and demand for low carbon branded aluminium products may have adverse impacts on revenue			
	Transitioning technology	Transitioning to lower-emission technology may result in increased capital and operational expenditure			
Reputation	Reputation: inaction	Reputational damage due to inaction on climate change may impact our capacity to secure capital, cost of capital, insurance and approvals, and affect ability to retain or attract skilled staff			

* This analysis was qualitative in nature. The impact is directional and limited to relative magnitude. There are inherent limitations with scenario analysis given it is forward-looking and encompasses many unknowns. This analysis is based on assumptions we made which may or may not prove to be correct. Additionally, there may be factors we have not considered as part of this analysis.

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Green circles reflect potential positive impacts.

The greater the size of the bubble, the greater the potential impact. We will refine these risks as material information comes to our attention.

Opportunities*

RISK	NAME	DESCRIPTION	SHORT TERM IMPACT	MEDIUM TERM IMPACT	LONG TERM IMPACT
Products and services	Low-carbon aluminium/alumina	Increased demand from expansion of low-carbon branded aluminium products to capitalise on customer demand for "green metals"			
Markets	Technology shifts and product demand	Increased demand from technology shifts as part of the clean energy transition and product substitution towards aluminium			
Energy source	Lower-emissions sources of energy	Increased uptake of lower-emission sources of energy may reduce operational expenditure			
Resilience to physical climate risks	Resilience to physical climate risk	Increased resilience to physical climate-related risks may minimise disruptions to operations and lower expenditure			

* This analysis was qualitative in nature. The impact is directional and limited to relative magnitude. There are inherent limitations with scenario analysis given it is forward-looking and encompasses many unknowns. This analysis is based on assumptions we made which may or may not prove to be correct. Additionally, there may be factors we have not considered as part of this analysis.

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2b. The impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.

As described in section 1b, Alumina Limited is the non-operating and minority partner of the AWAC joint venture, and its powers, including the ability to influence decarbonisation, are limited to the scope described in the AWAC joint venture agreements in respect of capital expenditure, acquisitions, and divestments/curtailments. As such, Alumina Limited can influence, but not control AWAC's climate-related strategy.

Products and services

AWAC's EcoSource brand provides low-carbon smelter-grade alumina (SGA) and certain non-metallurgical grade alumina (NMA), which have no more than 0.6 metric tonnes of CO_2e per metric tonne of alumina.

Supply chain and/or value chain

AWAC is still in the process of analysing its supply and value chain, in particular the impact of upstream and downstream Scope 3 emissions.

Adaptation and mitigation activities

Adaptation and mitigation activities are discussed in section 4a of this report.

Investment in research and development

AWAC is embarking on a research and development program to assess technical and commercial feasibility of using MVR and EC to support decarbonisation of the alumina refining process.

In 2021, the Australian Renewable Energy Agency (ARENA) provided approximately A$11 million for an MVR feasibility study. The technical and commercial viability of the technology was recently confirmed, and a 4 MW MVR module will be constructed at the Wagerup alumina refinery for trial in 2024.

For the EC project, the ARENA contributed support of A$8.6 million, whilst West Australia's Clean Energy Future Fund (CEFF) contributed A$1.7 million. This project will be delivered in two stages. Stage one includes study, selection, engineering and testing of the technology, followed by detailed design, construction and pilot testing in the second stage.

Operations (including types of operations and location of facilities)

The operations and the significant changes that have occurred over the past decade are described in the Introduction section of this report, pages 3-9.

Financial planning process (operating costs and revenues, capital expenditures and capital allocation, acquisitions or divestments, access to capital)

To the extent that a climate-related issue would fall under the scope of the joint venture agreement, and is required to be approved by Alumina Limited, Alumina Limited applies its Investment Approval Framework (IAF) to determine the appropriateness and prioritisation of the project compared to a number of factors including Alumina Limited's long-term strategy, and also with consideration of risks such as climate change, carbon price, social/community, reputational and environmental risks. The IAF also allows for scenario analysis of a range of factors including cost and price assumptions.

Alcoa and Alumina Limited both have net zero by 2050 ambitions. The priority for AWAC is decarbonising its refineries through technologically and commercially suitable solutions. The current focus is on research and development for MVR and EC.

Once a project has been approved and funding has been committed in accordance with the joint venture agreements, it can be incorporated into internal financial forecasts, and where relevant disclosed to shareholders. Alumina Limited would also include relevant cash flows (capital expenditure, and corresponding operating costs and revenue) in its internal corporate valuation model.

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2c. The resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.

The scenario processes

In order to test the resilience of AWAC's strategy to transitional risks under a 2°C scenario, Alumina Limited engaged a consultant with economic, commodity and climate change experience. The exercise incorporated the consultant's economic, climate and commodity forecasts. The use of the consultant's inputs was maximised to promote independence; hence the views of the consultant may differ to Alumina Limited's internal views.

Scope

Two scenarios were considered: a 'Base Case' of approximately ~2.5-2.7°C warming compared to pre-industrial levels, and a 2.0°C scenario as required under the TCFD framework. A key outcome of the scenario testing was to understand the qualitative/direction impact on AWAC taking into consideration the transitional risks.

The time horizons considered for the exercise were:

- short (2023-24);
- medium (2025-34); and
- long term (2035-50).

We also undertook a scenario at a 1.5°C warming scenario, however, the results were broadly consistent with the 2°C scenario.

Methodology

A dynamic model was created with annual forecasts out to 2050. Key inputs into the model included asset-level forecasts (production, costs, emissions profiles, fuel mix) GDP, carbon price and metal demand.

The model derives costs curves (including the impact of a carbon price), emissions intensity curves, demand/supply, and alumina/aluminium prices.

Limitations

Scenario testing utilises modelling to help inform our understanding of an outcome. Models employ a finite selection of data, and cannot account for every input or event and it is possible that assumptions may not eventuate. Models may not be able to respond to "sudden shocks" to certain assumptions. We do not know all plans of peers, and many plans have not been finalised or achieved final investment decision. Also, it is not possible to model all producers' behaviour and how a particular producer may respond to an event (e.g. what carbon price would incentivise a producer to decarbonise).

Key assumptions of the consultant

	ASSUMPTION^							
Key driver	**Base case (2.5–2.7 degrees)**				**2 degrees case**			
Description	The base is calculated from committed and funded reduction activities, resulting in ~2.5-2.7°C warming compared to pre industrial levels. Under a base case, decarbonisation is muted.				Accelerated energy transition, which results in greater demand for commodities, such as aluminium and in-turn alumina. Higher carbon prices mean that secondary aluminium will continue to grow in popularity.			
GDP annual growth	China: ~3-6% India: ~4-7% RoW ("Rest of World"): ~1.5-3%				China: ~3-6% India: ~4-7% RoW: ~1.5-3%			
Aluminium demand growth to 2050 ("CAGR", cumulative annual growth rate) to 2050	Total: 1.3% Primary: 0.6% Secondary: 2.9%				Total: 1.7% Primary: 0.8% Secondary: 3.6%			
Alumina demand growth to 2050 (CAGR)	0.5%				0.7%			
Energy mix/grid emissions intensity	In-line with jurisdictional forecasts							
Technology	Incremental step changes have been modelled by country/grid/technology/age of plant etc.							
Carbon price US$/t*	**Average**	2022-2030	2030-2040	2040-2050	**Average**	2022-2030	2030-2040	2040-2050
	China:	20	61	98	China:	43	108	136
	India:	1	29	69	India:	5	68	110
	RoW:	25	75	112	RoW:	40	100	126

^ Assumptions have been aggregated in order to simplify presentation. In the model, annual assumptions are utilised.

* Carbon pricing is one of the primary mitigation tools that induces companies to decarbonise. The carbon price is derived from modeling that indicates a price that incentivises a party to change its behaviour. Carbon prices will be regional, and be dependent on the "developed status" of a particular country. The carbon prices displayed are blended.

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Potential impact on AWAC and resilience of strategy

The results of the scenario testing indicate that AWAC's strategy should be generally resilient under a 2°C scenario. As explained earlier, AWAC has a decarbonisation strategy that is aimed at electrifying its refineries in order to effectively switch from fossil fuels to renewable electricity. However, being a low-emissions alumina producer puts AWAC in a strong position to begin with relative to peers.

AWAC is in this enviable position as the bulk of its refining capacity in Western Australia is adjacent to long-life bauxite mines, and close to relatively low-cost natural gas transmission.

A general observation that we have around the aluminium industry is that whilst many producers have net zero aspirations, decarbonisation strategies rely on commercialisation of technology which is currently not utilised at scale in the production of alumina or aluminium (for example hydrogen, and inert anodes).

Commercialisation of such technologies may take some time, and deployment of such technologies will take longer, and hence there is uncertainty involved in the decarbonisation pathway of the aluminium value chain.

Primary aluminium, and consequently alumina, are expected to be in strong demand for this decade, which will put upward pressure on price of these two commodities. In future decades, under lower emissions scenarios, there may be an increased preference for lower energy intensity secondary aluminium at the expense of primary aluminium. Carbon prices are likely to result in higher aluminium and alumina prices, whereby alumina producers like AWAC are likely to see margin expansion due to lower carbon liabilities.

The findings below summarise the direction/ qualitative impact on AWAC's resilience associated with the scenario testing.

Summary of directional/qualitative findings

The scale identifies indicative impact to AWAC ('resilience') as a result of a 2°C scenario relative to the Base Case

	Risk	Sub risk/ opportunity	General commentary	Potential impact on AWAC (Delta from the Base Case to 2° degree scenario) MEDIUM TERM IMPACT (2024-34) High Negative Impact / Neutral / High Positive Impact	Potential impact on AWAC (Delta from the Base Case to 2° degree scenario) LONG TERM IMPACT (2035-50) High Negative Impact / Neutral / High Positive Impact
RISKS	Policy & legal	Carbon Pricing	To achieve a 2° degrees scenario, additional emissions reduction activities will be required. Policy settings involving a carbon price would be required in order to induce decarbonisation at a faster rate. Carbon prices would vary by region and level of country development, but are likely to put upward pressure on alumina and aluminium prices. Lower carbon alumina producers such as AWAC will benefit from higher prices, but without the additional carbon liability of high emission intensity producers. This would be akin to a "green premium".		
	Technology	Changing customer preferences	Aluminium, due to its physical properties (lightweight, resilient, recyclable), will be an important decarbonisation metal resulting in increased demand. Low carbon alumina, such as AWAC's EcoSource, is likely to be a key input to meet customer preference for low carbon aluminium.		
	Market	Material substitution	Aluminium is a versatile material, but it may be substituted for other materials (e.g. copper, steel), depending on the application. A key determining factor that may induce substitution is the price of a commodity. There may be some substitution to aluminium, or from aluminium within certain sectors, but there is likely to be limited net impact.		
		Substitution of primary production	Secondary (recycled) aluminium requires less energy to produce than primary aluminium (requires alumina). In the medium term, there will continued to be growth for primary aluminium, and consequently alumina. In the longer term, as potentially recyclable aluminium is freed up, there is likely to be a preference towards secondary aluminium, depending on availability (given the long durability of aluminium) especially in the event of high carbon prices.		
OPPORTUNITIES	Products & services	Low-carbon alumina & aluminium	Low carbon alumina products, such as AWAC's EcoSource, are likely to be a key input to meet customer preference for low carbon aluminium.		
	Markets	Technology shifts & product demand	The energy transition will drive additional aluminium demand due to increased intensity and volume of aluminium use in transition related technologies (e.g. as technology shifts to lightweight electric vehicles, new transmission networks to renewable energy zones). It is expected that there will be continued growth in demand for primary aluminium (and consequently alumina) in the medium term. In the longer term, there is still expected to be strong demand for aluminium, however there is likely to be a growing preference to secondary aluminium.		

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3. RISK MANAGEMENT

3a. The organisation's processes for identifying and assessing climate-related risks.

Alumina Limited's general approach to risk management

Alumina Limited's risk management processes are summarised in the Corporate Governance Statement located on the Company website at www.aluminalimited.com/about-governance/, and the 2022 Annual Report www.aluminalimited.com/annual-report/.

Alumina Limited maintains a formal Risk Management Framework (RMF), which is overseen by the Audit and Risk Management Committee (ARMC). The key elements of the RMF are described in sections 1a and 1b of this report.

Alumina Limited's specific process for identifying and assessing climate-related risks

Climate-related risks are identified and assessed in a manner which follows Alumina Limited's general approach to risk management.

As noted in the 2022 Annual Report, Alumina Limited has a specific "climate change risk". The ESG Team, led by the Chief Executive Officer and the General Counsel are joint owners of this risk. Thus, the ESG Team is responsible for identifying and assessing climate-related risks.

The relative significance and magnitude of climate-related risks is discussed throughout the annual RMF process, when developing the annual work plans for the ESG Team, and the project whereby we identified climate-related risks and opportunities as described in section 2a of this report. Emerging regulatory requirements related to climate change (e.g. limits on emissions) are considered in Alumina Limited's RMF, along with the other physical and transitional risks noted in section 2a of this report.

3b. The organisation's processes for managing climate-related risks.

Process for climate-related risk prioritisation and management

Alumina Limited's ESG Team is responsible for managing climate-related risks. As noted in section 1b, Alumina Limited is not the manager of the joint venture, so is restricted to managing climate-related risks in accordance with the joint venture agreement, and influencing our joint partner.

As described in section 2b and 4a of this report, the risks of highest priority are transitional risks in the medium term, and impoundments in respect of physical risks.

These risks are reflected in Alumina Limited's ESG Team's annual workplans, which in particular prioritise decarbonisation as part of climate-related risks. Priorities are determined by the ESG Team, and discussed with the Sustainability Committee. As with other ESG Risks, Alumina Limited engages with Alcoa on the subject of climate-related risks through the Strategic Council, and meetings with relevant Alcoa representatives.

Recent examples of climate-related risk management prioritisation

Alumina Limited believes that the key to mitigating the transitional risks described in section 2b and 4a is reducing the carbon footprint of AWAC, and maintaining its position as a leader in emissions intensity. Having a low emissions intensity, and actively pursuing improvements, helps to insulate AWAC from risks such as 'policy & legal', 'market', 'technology', and 'reputation'.

AWAC's emission intensity has historically reduced through closure or sale of facilities that were high emission and high cost. Decisions to close assets are never easy, and are undertaken with consideration of many factors, including market conditions, age of plant and available inputs (e.g., bauxite, energy).

In terms of physical risks, Alumina Limited reviews AWAC's impoundment management. AWAC has committed to conform with the ICMM's Global Industry Standard on Tailings.

Materiality

In accordance with Alumina Limited's Risk Management Framework, materiality isn't necessarily prescriptive; however, we use an array of possible conventions to determine what may be material (e.g. financial metrics, qualitative indicators). Climate Change is a material risk for Alumina Limited.

For ESG risks in general, including climate change risk, Alumina Limited's materiality assessment involves the following:

- Consideration of material risks identified by Alcoa
- Comprehensive materiality assessment (approximately every three years) guided by GRI Standards
- Engaging with internal and external stakeholders annually
- Consideration of industry issues and trends, including from discussions with a number of industry associations.

3c. The processes for identifying, assessing, and managing climate related risks are integrated into the organisation's overall risk management.

The process for identifying, assessing and managing climate-related risks is embedded within Alumina Limited's RMF. There are specific risk profiles for ESG and climate change risks, as well as climate-related metrics in Alumina Limited's Risk Appetite Statement. Climate risk is also considered in the IAF. Climate change is effectively managed through the ESG Team.

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4. METRICS AND TARGETS

4a. The metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.

Metrics used by Alumina Limited to assess, measure and manage climate risks and opportunities

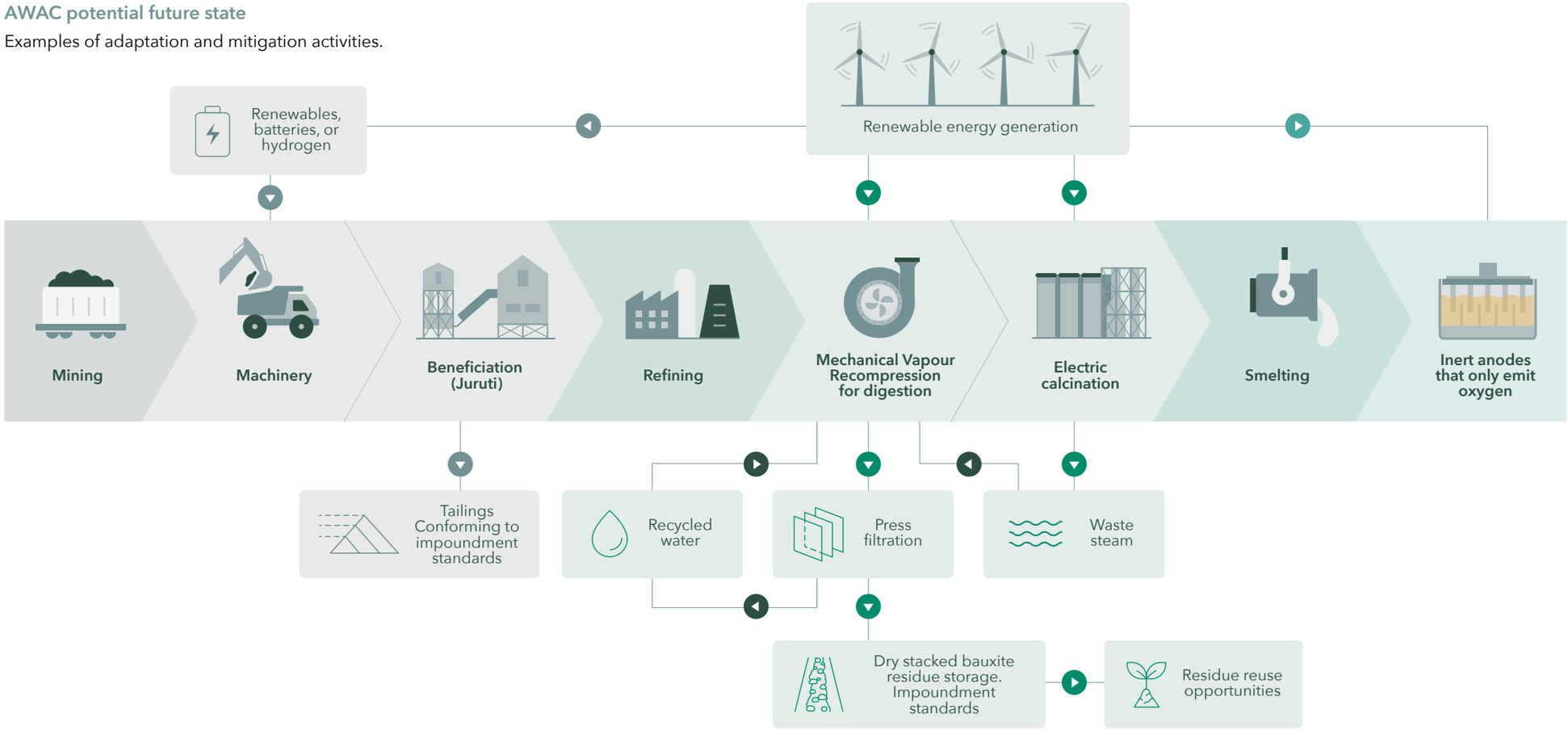
Alumina Limited concentrates on an array of metrics to assess, measure and manage climate risks and opportunities. Most of these key metrics have been published in our sustainability updates for some time.

Metrics are not specifically incorporated into remuneration for Alumina executives; however, elements of the sustainability work program are included in the Short-Term Incentive (STI) scorecard, as described in the Remuneration Report included in the Alumina Limited Annual Report of 2022 www.aluminalimited.com/annual-report/.

The adaptation and mitigation activities listed are just indicative courses of action that may be taken to reduce risks. Unless otherwise stated, the project or CAPEX may not have been approved or committed.

AWAC potential future state

Examples of adaptation and mitigation activities.



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Examples of potential adaptation and mitigation activities

	Metric	Units	Description & importance	Potential risks & opportunities	Potential adaptation & mitigation activities
Energy	Energy intensity	Gigajoule (Gj) of energy required per tonne of production	As AWAC's energy is currently derived from fossil fuels, improving energy intensity through efficiency can help reduce consumption of fossil fuels, and consequently reduce AWAC's emissions. Using less energy is preferable also as it reduces production costs. Additionally, fuel switches, electrification of refineries provide the potential to use alternate sources of energy (e.g. electricity generated from renewables).	**Risks** • Acute & chronic physical risks (listed in section 2a) may manifest as a result of industry in general not reducing GHG emissions. • All transitional risks (listed in section 2a) may eventuate. **Opportunities** • All opportunities (listed in section 2a) may eventuate as a result of AWAC decarbonising.	**Refining** • Mechanical Vapour Recompression • Electric calcination • Fuel switches • Electric boilers **Smelting** • Grid greening (or potential for renewable power purchase agreement) • Inert anode technology **Mining** • Battery, green hydrogen technology
	Direct energy consumption	Gigajoules (Gj)			
	Indirect energy consumption	Gigajoules (Gj) of electricity & steam			
	Percentage of renewable electricity	Renewable electricity (Gj) divided by total electricity (Gj)			
Greenhouse gas (GHG) emissions	Refinery greenhouse gas intensity	Tonnes of GHG (scope 1 & 2) per tonne of alumina production			
	Smelter greenhouse gas intensity	Tonnes of GHG per tonne (scope 1 & 2) of aluminium production			
	Greenhouse gas emissions	Tonnes CO_2e (scope 1, 2 & 3)			
Water	Freshwater intensity	Cubic metres/tonne of production	AWAC's refineries (and Juruti), are reliant on water for operations. Reducing and recycling water are preferable to freshwater use, particularly in water scarce areas such as the Darling Ranges.	**Risks** • Lower rainfall: water stress/quality • Water security • Regulatory standards • Reputation: inaction	**Refining** • Mechanical Vapour Recompression • Press filtration (deployed at Pinjarra & Kwinana)
	Freshwater withdrawal	Millions of cubic metres			
	Total water-use intensity (water stress areas)	Cubic meters of water per metric tonne of alumina produced			
Waste management	Bauxite residue storage efficiency	Square metres of land required per thousand tonnes of alumina produced	Critically, AWAC's operations rely on impoundments to manage waste from the refining process, and to a lesser extent tailings. Reducing or recycling refinery waste (e.g. water) helps reduce waste that needs to be managed, for example in residue storage areas (RSAs).	**Risks** • Flooding: tailings & dam design • Higher rainfall: tailings & dam design • Flooding: dam failure • Lower rainfall: water stress/quality • Conflict: water security • Regulatory standards • Reputation: inaction **Opportunities** • Secondary applications of bauxite residue	**Refining** • Mechanical Vapour Recompression • Press filtration (deployed at Pinjarra & Kwinana) • Conformance with the Global Industry Standard on Tailings Management by August 2023 • Potential for secondary uses of bauxite residue
	Bauxite residue intensity	Tonnes per tonnes of alumina produced			
	Landfilled waste	Tonnes			
Land use	Five-year disturbance to rehabilitation ratio	Disturbance excludes long-term infrastructure	AWAC's bauxite mines disturb land. AWAC's mines generally have shallow top soil, overburden covering the ore body. After bauxite has been extracted, rehabilitation can occur quickly to return the area to its natural state. Vegetation is vital to absorb GHG, limit erosion & flooding.	**Risks** • Acute & chronic physical risks (listed in section 2a) may manifest as a result of industry in general not reducing GHG emissions. • Regulatory standards • Reputation: inaction	**Mining** • Comprehensive rehabilitation plans

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4b. Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.

Greenhouse gas emissions

AWAC has been disclosing its Scope 1 & 2 greenhouse gas emissions since 2010, and its Scope 3 emissions since 2017. The risks associated with greenhouse gas emissions were briefly described in section 4a.

2022 GHG EMISSIONS	MILLION TONNES CO_2e (FULL FACILITY BASIS)	MILLION TONNES CO_2e (EQUITY BASIS)
Scope 1 (direct)	7.4	6.0
Scope 2 (indirect)	3.8	2.4
Total (Scope 1 & 2)	**11.2**	**8.4**
Scope 3^	45.6	

Key industry specific GHG efficiency ratios

The key aluminium industry specific GHG efficiency ratios are:

2022 GHG EMISSIONS*	UNITS	TONNES CO_2-E PER UNIT OF PRODUCTION
Refinery greenhouse gas intensity	Tonnes of GHG (Scope 1 & 2) per tonne of alumina production	0.510
Smelter greenhouse gas intensity	Tonnes of GHG per tonne (Scope 1 & 2) of aluminium production	12.91
Combined smelter and refinery	Tonnes of GHG per tonne of production (Calculated as smelting intensity + (1.9 x refining intensity))	13.876

* Utilises Greenhouse Gas Protocol developed by the World Resources Institute and World Business Council for Sustainable Development to establish boundaries for calculations and accounts for mergers, acquisitions, divestitures, startups, curtailments and closures of operating facilities. The Intergovernmental Panel on Climate Change Guidelines and country-specific databases, such as the U.S. Environmental Protection Agency's Emissions & Generation Resource Integrated Database, continue to serve as our source of data for GHG applicable emission factors.

^ Scope 3 has been calculated on an Alcoa control basis. Hence it excludes the scope 3 emissions associated with smelting of AWAC alumina in Alcoa smelters.

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4c. The targets used by the organization to manage climate-related risks and opportunities and performance against targets.

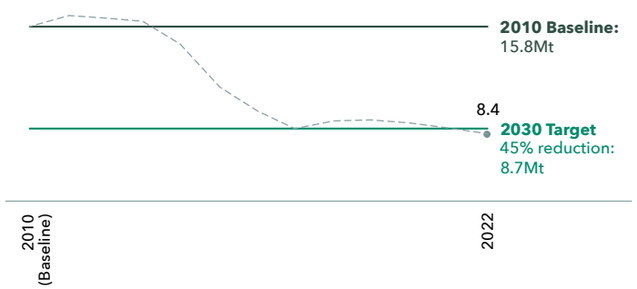
Greenhouse gas emissions (Scope 1 & 2)

Million tonnes of CO_2e

(AWAC equity share basis, target set by Alumina Limited for comparison with the IPCC target.)

45% reduction in scope 1&2 by 2030 from a 2010 baseline (in-line with IPCC)

Historical emissions have been adjusted to remove the Clarendon Refinery, which was sold in 2014.

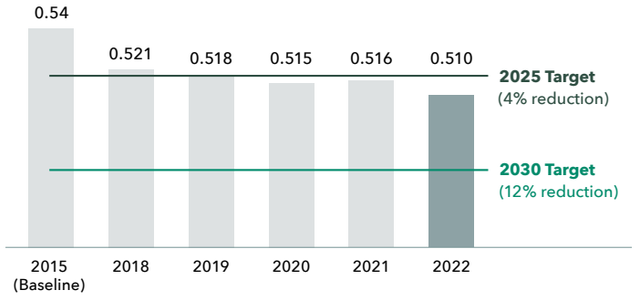


Refinery GHG intensity

Tonnes of GHG per tonne of alumina production

(AWAC full facility basis, AWAC set target)

4% reduction by 2025 & 12% by 2030 from a 2015 baseline.

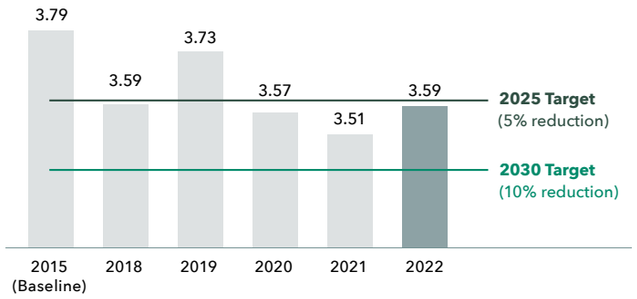


Total Water-use Intensity – Locations in AWAC-defined Water-stressed Areas*

Cubic meters of water per metric tonne of alumina produced

(AWAC full facility basis, AWAC set target)

From a 2015 baseline, reduce the intensity of total water use from water-scarce locations by 5% by 2025 and 10% by 2030.

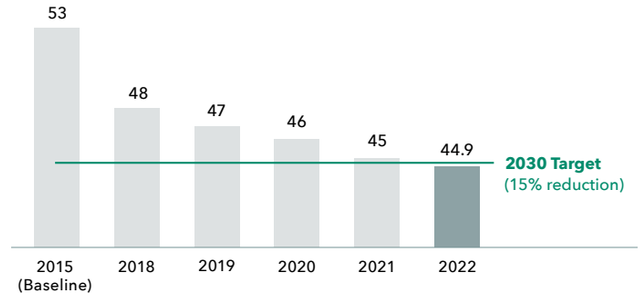


Bauxite residue storage efficiency

Square metres of land required per thousand tonnes of alumina produced

(Alcoa full facility basis, AWAC set target)

From a 2015 baseline, reduce bauxite residue land requirements per metric tonne of alumina produced by 15% by 2030.

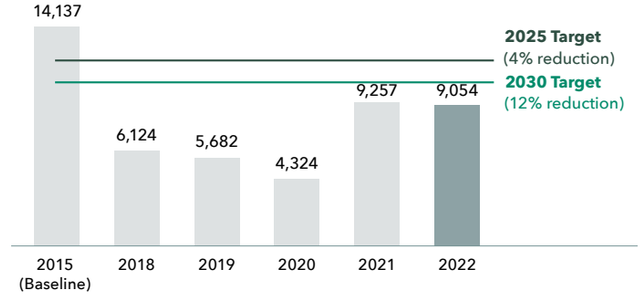


Landfilled waste

Tonnes

(AWAC full facility basis, AWAC set target)

From a 2015 baseline, reduce landfilled waste by 15% by 2025 and 25% by 2030.

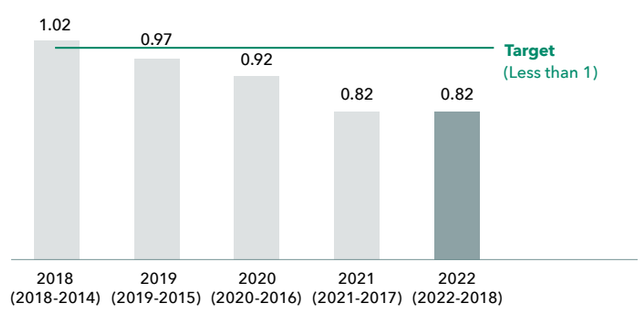


Mine disturbance ratio

Ratio of active mining disturbance (excluding long-term infrastructure) to mine rehabilitation.

(Alcoa full facility basis, AWAC set target)

Maintain a corporate-wide running five-year average ratio of 1:1 or better for active mining disturbance (excluding long-term infrastructure) to mine rehabilitation.



* The baseline and intensity values have been adjusted to reflect the removal of Alumar Refinery from the definition of an Alcoa-defined water-scarce location based on a new risk assessment conducted in 2022.

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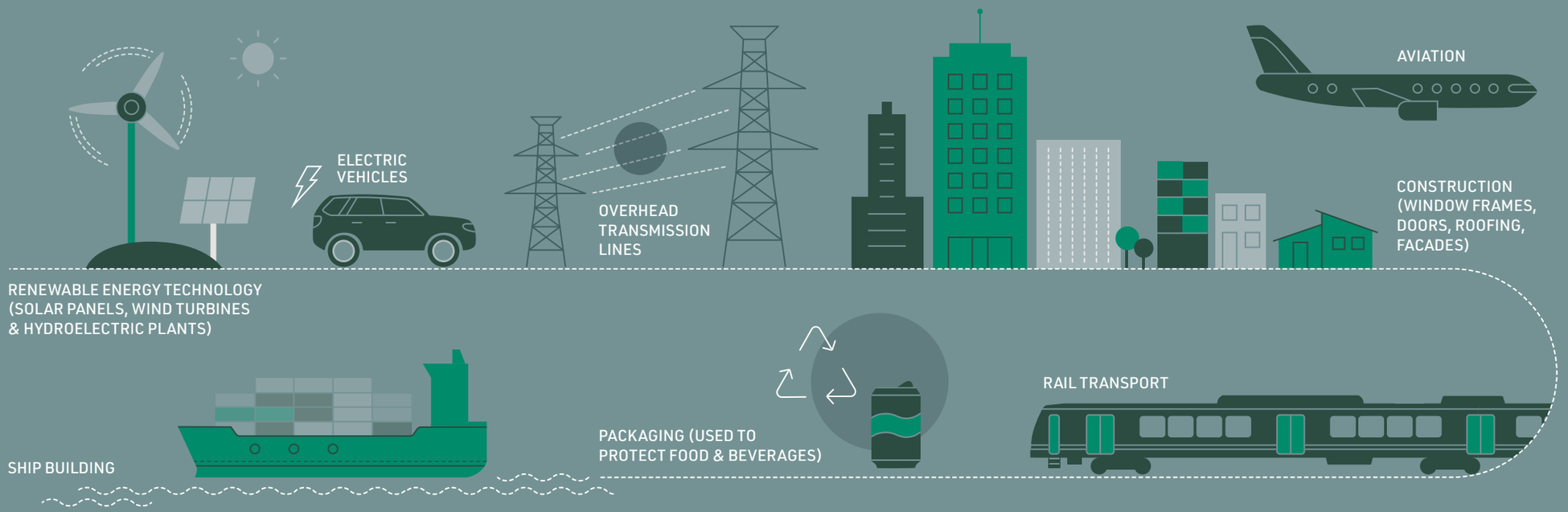
ALUMINIUM — METAL FOR THE FUTURE

Inspired by the 50th anniversary of the International Aluminium Institute (IAI), Alumina prepared this article to reflect on the role of aluminium as a Metal for the Future. Demand for a sustainable future in a decarbonised world is gaining more importance every day and aluminium has unique qualities needed to play a vital role in this transition.

Aluminium is a lightweight, strong, corrosion-resistant, and infinitely recyclable metal, making it a sustainable choice for applications that advance humanity.

Some of the key benefits of aluminium are its lightweight and high strength-to-weight ratio. It is three times lighter than steel, and just as strong, which makes aluminium a versatile component used in a range of products and industries.



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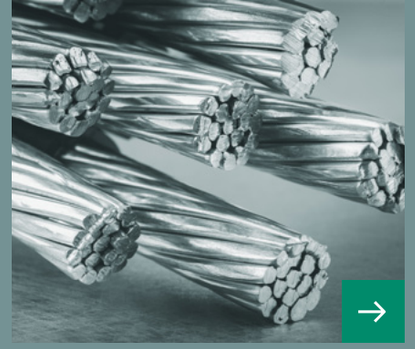


3x
lighter than copper, making aluminium a popular metal for overhead transmission lines

Aluminium comprises
18.9%
of the key minerals used in an electric vehicle (EV) battery

85%
Aluminium comprises 85% of the total components of solar panels

The automotive industry has been using aluminium extensively in place of heavier materials like steel to reduce the overall weight of vehicles and increase fuel efficiency.

For instance, aluminium content in an average car rose from 35 kg in the 1970s to about 125 kg today, and in an electric vehicle (EV) battery, aluminium comprises 18.9% of the key minerals used.
(source: Transport and Environment)

Aluminium has also been used as a key manufacturing material in aviation, rail transport, and ship building, where its lightweight properties contribute to lower fuel consumption and reduced carbon emissions.

The transportation sector is the largest consumer of aluminium globally and consumption is expected to continue to rise as the demand for fuel-efficiency vehicles continues to grow, and stricter fuel economy and emissions policies are put in place. According to CRU, the global demand for aluminium in the transportation sector is expected to reach 31.3 Mt in 2030 – around 8 Mt more than its 2022 consumption of 23.3 Mt.

Aluminium is corrosion-resistant, durable, and can withstand extreme weather conditions. In construction, aluminium can be used in window frames, doors, roofing, facades and other outdoor applications. In 1931, Aluminium was first widely used in the construction of the Empire State Building in New York.

Currently, the construction sector is the world's second-largest consumer of aluminium. CRU reported that the sector consumed 21.4 Mt of aluminium in 2022, demand is expected to reach 24.4 Mt in 2030.

The use of aluminium in construction also contributes to lower transportation costs, when compared to other materials like steel or concrete. It also can improve energy efficiency by reducing heating and cooling costs in buildings.

Aluminium is also commonly used in other industries such as packaging, electrical and manufacturing in the production of renewable energy technologies.

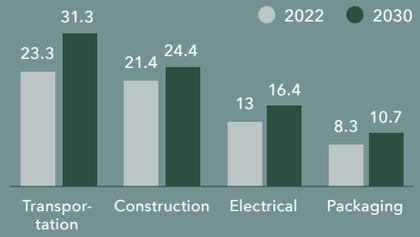
In packaging, aluminium can be used to protect food and beverage products. CRU stated that the packaging industry consumed 8.3 Mt of aluminium in 2022, and it is expected to have a substantial growth to 10.7 Mt in 2030. This is mainly due to e-commerce and the need for more sustainable packaging solutions.

Aluminium's high electrical conductivity makes it suitable for electrical engineering. It is cheaper and three times lighter than copper, making it more popular for overhead transmission lines. CRU's predictions for the sector show an increase in consumption to 16.4 Mt in 2030 – approximately 3.4 Mt higher than its consumption in 2022 of 13 Mt.

In addition, aluminium is an essential material in the production of renewable energy technologies like solar panels, wind turbines, and hydroelectric plants. Its lightweight properties and durability make it an ideal choice for these applications. For instance, aluminium comprises 85% of the total components of solar panels.
(source: The Aluminum Association)

Another significant benefit of aluminium is that it is infinitely recyclable. According to IAI, approximately 75% of the 1.5 billion tonnes of aluminium produced since 1888 is still in use today due to the infinite recyclability and longevity of the metal.

The recycling process requires only 5% of the energy needed for primary production, and it can occur repeatedly without degrading its properties. On average, one tonne of recycled aluminium saves over 16 tonnes of greenhouse gas emissions, globally. Which is equivalent to driving over 40,000 miles in an average vehicle in the United States. The IAI's Aluminium Sector Greenhouse Gas Pathways to 2050 report, projected that 81 million tonnes* of aluminium will be produced from recycled scrap in 2050.



Source: CRU, June 2023.

While addressing environmental issues with innovative and sustainable solutions, the aluminium industry is set to continue to rise in the future. In 2030, the transport and construction sectors are expected to remain the largest consumers of aluminium, but significant growth is expected in the electrical and packaging industries. Driven by its unique properties and benefits, aluminium is a metal that is both attractive and sustainable choice for a range of industries and applications. For those reasons, Alumina believes Aluminium is a Metal for the Future.

* Projection under the 1.5 Degree Scenario Recycled scrap (68 million tonnes from post-consumer scrap, and 13 million tonnes from new/manufacturing scrap). CRU, June 2023.

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AWAC

This section of the report addresses how Alcoa, as operator of AWAC, manages its material sustainability topics.

Alcoa applies a consistent management approach across all its operations, including those that are part of AWAC. However, we have included some content relevant to specific AWAC sites. Performance data in these chapters and in the Data Pack relate to AWAC only, on a 'full facility' basis, except where otherwise noted.

Further detail on Alcoa's approach and performance can be found in its 2022 Sustainability Report and on its website.

AWAC PERFORMANCE SNAPSHOT 2022

	Metric	2022	% change from 2021	
AWAC	Revenue ($ million)	5,714.50	9.4%	▲
	Bauxite mined (million tonnes on wet basis)^	39.9	(10.7%)	▼
	Alumina produced (million tonnes)	11.8	(6.3%)	▼
	Aluminium produced ('000 tonnes)	159	5.3%	▲
	GHG (CO2-e '000 tonnes)	8.40	(4.6%)	▼
	GHG intensity (per tonne of production)`	13.88	(1.6%)	▼
	Energy intensity (Gj per tonne of production)	75.1	2.2%	▲
	Freshwater intensity (per tonne of aluminium production)+	4.14	(4.8%)	▼
FULL FACILITY	Employees	6,064	(2.1%)	▼
	Lost work days~	0.34	14.8%	▲
	Days away*	0.71	9.7%	▲
	Total Recordable Injury Rate#	1.20	5.4%	▲

^ Including moisture content (as opposed to 'bone dry' weight).
` Combined smelter and refinery, calculated as smelting intensity + (1.9 x refining intensity).
+ Alcoa calculates intensity measures based on unit of aluminium production. To adjust for the alumina part of the value chain, refining is included at a ratio of 1.9 metric tons of alumina produced to 1.0 metric tons of aluminium produced.
~ Lost workday rate represents the number of injuries and illnesses resulting in one or more days away from work per 100 full-time workers.
* Days away, restricted and transfer rate includes lost workday cases plus cases that involve days of restricted duty and job transfer per 100 full-time workers.
# Total recordable injury rate represents the number of injuries and illnesses resulting in days away from work, job transfer or restriction, medical treatment or other recordables per 100 full-time workers.

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AWAC'S APPROACH TO SUSTAINABILITY

Sustainability is embedded in AWAC's strategy and vision to reinvent the aluminium industry for a sustainable future.

There are three strategic components in AWAC's approach:

OUR COMMUNITIES

Maintain our social license to operate by creating sustainable value for our stakeholders and, in particular, our host communities.

OUR PRODUCTS

Improve our profitability by enhancing the value of our products through differentiation.

OUR OPERATIONS

Reduce risk and future liabilities by minimising social and environmental impacts.

STRATEGIC LONG-TERM GOALS

The long-term sustainability goals guide decision making related to topics that are material for AWAC and its stakeholders. The materiality process and goals are periodically reviewed and updated, and progress measured.

Strategic long-term goals*

FOCUS AREA	RELATED SDGS	GOAL	2022 PROGRESS
Climate change READ MORE →	7 12 13	Align our **GHG emissions** intensity target (Scope 1 and 2 associated with our refining and smelting operations) with the 2°C decarbonisation pathway by reducing intensity by 30 percent by 2025 and 50 percent by 2030 from a 2015 baseline. Ambition to achieve net-zero GHG emissions by 2050.	25.1 percent reduction from 2015
Water READ MORE →	6 9 12 14	From a 2015 baseline of 3.79 m3 water/mt Al, reduce the intensity of our total **water use** from water-scarce locations by five percent by 2025 and 10 percent by 2030.	5.3 percent decrease from 2015
Waste READ MORE →	12 15	From a 2015 baseline of 131.7mt, reduce **landfilled waste** by 15 percent by 2025 and 25 percent by 2030.	37.6 percent reduction from 2015. From a 2015 baseline of 53 m2/1000t m2/ k mt Al
Impoundment management READ MORE →	12 15	Reduce **bauxite residue** land requirements per metric tonne of alumina produced by 15 percent by 2030.	15.6 percent reduction from 2015
Mine rehabilitation READ MORE →	12 15	Maintain a corporate-wide running five-year average ratio of 1:1 or better for active mining disturbance (excluding long-term infrastructure) to **mine rehabilitation**.	0.82 ratio for the 2018 to 2022 period
Safety and health READ MORE →	3 8	**Zero fatalities and serious injuries** (life-threatening or life-altering injuries and illnesses).	Zero fatalities and one serious injury in 2022+
People READ MORE →	5 10	Achieve a more **inclusive culture** that reflects the diversity of the communities where we operate.	Increased the percent of women in our global employee population from 17.17 to 18.48 percent. The percent of new hires from underrepresented populations was 51.26 percent
Shared Value Creation READ MORE →	3 4 5 8 10 16 17	By the end of 2022, implement a **social performance management system** (SP360) at all locations, including the definition of performance metrics and long-term goals to be achieved by 2025 and 2030.	Completed the implementation of SP360 in our mining operations in Australia and Brazil, defined performance metrics and identified a long-term goal

* Alcoa-wide data. + There was one serious injury in 2022 at a non-AWAC facility.

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GOVERNANCE

This section offers an overview of Alcoa's governance functions as owner and operator of AWAC. Alumina Limited's governance functions are discussed on page 14 of this report. Page 16 includes information on how Alumina Limited engages with Alcoa.

ETHICS AND GOOD GOVERNANCE

Why this matters

Keeping high ethical standards both maximises long-term value for stakeholders and maintains AWAC's social license to operate. Robust governance practices and processes guide AWAC's approach to sustainability with a clear vision, purpose and set of values.

How we manage this

Alcoa's values unify global operations and act as a blueprint for AWAC's interactions with customers, communities and suppliers. Alcoa has long kept the core values of integrity, excellence and care for people, and in 2021 the company added a fourth value: to lead with courage.

Governance structure

Alcoa's Board of Directors provides oversight of AWAC's operations, including governance of sustainable development. Alcoa's corporate governance guidelines and board committee charters are set up to promote the effective functioning of the Board. Further details can be found on Alcoa's website.

The Safety, Sustainability and Public Issues Committee provides guidance on matters relating to corporate responsibility, health and safety, social issues and environmental sustainability, including climate risk.

Alcoa's governance structure

The Sustainability Governance Board (SGB), which is a subset of Alcoa's executive team, was established in 2022 to provide a dedicated forum to focus on the work of the Alcoa CoEs while also guiding and endorsing a global approach to social sustainability, biodiversity and other material issues related to the sustainability strategy. The SGB is responsible for approving sustainability strategies, evaluating results and managing AWAC's sustainability risks.

The Alcoa Human Rights Council defines and oversees the Human Rights Policy, with a mission to respect and support individual and collective human rights affected at AWAC locations. The council comprises representatives from different operating regions and is overseen by two members of Alcoa's executive team, who are responsible for reporting back to the executive leadership on the council's progress.

The Environment, Health and Safety (EHS) compliance committee oversees and monitors EHS compliance-related and associated risks. The committee comprises leaders from Internal Audit, Ethics and Compliance, Legal, and EHS. Alcoa's Chief Executive Officer, Chief Financial Officer and General Counsel also support the committee's work with quarterly compliance reviews.

Risk management

AWAC's risk management process is defined by the Integrated Framework for Enterprise Risk Management (ERM) from the Committee of Sponsoring Organizations of the Treadway Commission (COSO). The International Organization for Standardization's ISO-31000 (risk management) is also used as a guideline. In 2022, Alcoa continued to implement operational risk management to evaluate and manage risks across our operations. Alcoa's management teams are required to make routine reports to the Alcoa Board of Directors, who oversee the company's risk management.

In 2022, to guide the ERM process, an updated sustainability materiality assessment was linked to the corporate risk management process. This step improved the understanding of potential impacts and the appropriate steps to manage them.

Tailored risk management systems are applied to specific business risks, including:

- New facilities or expansion projects
- Environment, health and safety (EHS)
- Human rights
- Cybersecurity.

Compliance

Engagement with relevant governments and regulators enables AWAC to keep abreast of current and emerging regulatory policies. Due to the geographic diversity and complexity of Alcoa's operations, compliance objectives are managed by a global team of in-house lawyers and outside legal counsel, under the leadership of Alcoa's General Counsel.

Environmental compliance

AWAC aims to meet or exceed the standards required by the local and regional jurisdictions where it operates, and also abides by agreements with local communities and commitments made through industry associations and partnerships, including ICMM.

An environmental compliance and incident tracking system supports AWAC to address issues, track progress toward goals and targets, and verify the effectiveness of actions. Environmental compliance assessments are integrated into the risk-based EHS assessment process. Assessments are based on a location's operational risk and specific needs and challenges, and draw on internal and external subject matter experts as well as local management.

In 2022 AWAC operating locations had no significant environmental non-compliances. Alcoa defines a significant non-compliance as receiving a fine or penalty exceeding US$100,000.

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Ethics

Alcoa's Ethics and Compliance (E&C) organisation is responsible for promoting an ethical culture and preventing, detecting, and responding to potential violations of Alcoa's code, policies, and procedures.

All AWAC employees are governed by the Code of Conduct and Ethics, a moral framework which is aligned with Alcoa's values and governs business conduct worldwide. The Code of Conduct defines AWAC's culture, values and expectations. It is provided in eight languages and made available to each employee along with broader policies relating to AWAC, through the company intranet.

In 2022 the Board of Directors updated the Code of Conduct to include new sections on human rights, supplier relationships, inclusion, diversity, and sustainability. In 2022 the Code of Conduct was applied to Alcoa's CEO, CFO and other financial representatives, who previously abided by a standalone section.

Communicating and training

All AWAC employees are required to complete annual Code of Conduct and Ethics training. Training can be taken in-person or online and is updated on a regular basis.

CURRENT CODE OF CONDUCT AND ETHICS TRAINING COVERS:

- Key policies and procedures
- Speaking up
- Treating people with respect
- Anti-retaliation
- Issue reporting
- Gifts, hospitality, and travel
- Harassment and bullying
- Inclusion and diversity

Salaried employees must also complete annual trainings in anti-corruption,[1] data privacy and respect in the workplace. A Business Conduct Survey requires employees to disclose any actual or potential conflicts of interest. Respect in the workplace training covers expectations for leaders, steps to report concerns through a help chain, and the potential consequences for failing to address inappropriate behaviours. See further on Harassment and Bullying page 49.

OTHER GOVERNANCE POLICIES AND PROGRAMS SUPPORTING THE IMPLEMENTATION OF ETHICAL AND RESPONSIBLE BUSINESS PRACTICES INCLUDE:

- Corporate Governance Guidelines
- International Trade Compliance Policy
- Anti-Corruption Policy
- Human Rights Policy
- Data Privacy Program

AWAC's stakeholders and employees are encouraged to share their ideas, opinions and concerns. A global network of volunteer Integrity Champions has been set up to promote a culture of integrity, raise awareness over ethics, and serve as trusted advisors to employees. AWAC employees have access to the company intranet and a quarterly E&C newsletter, as well as the provision of regular training courses to reinforce a speak-up culture.

Reporting and investigating

A confidential Integrity Line is accessible at all times in multiple languages for both internal and external stakeholders. Reports can be submitted anonymously online via the Integrity Line website, email or postal mail and are received by an independent company, which directs them to the Alcoa E&C department for follow-up.

In 2022, 12 percent of the submissions to the Integrity Line resulted in disciplinary action, and 52 percent were inquiries or other matters that did not require investigation or substantial follow-up. Most submissions (70 percent) were employment related, with the remainder related to business integrity, safety and health, human rights and general inquiries.[2]

Further detail on the Integrity Line process can be found the Alcoa 2022 Sustainability Report page 24.

Anti-corruption program

Alcoa has robust processes designed to prevent bribery and corruption and comply with applicable laws in host countries. The compliance program is designed to meet or exceed the recommendations of the US Department of Justice. To lower the risk of corruption, Alcoa does not operate any facilities in the lowest-ranked countries in Transparency International's Corruption Perception Index.

A suite of policies and procedures offers guidance on the issues that must be reported to the E&C organisation, including:

- Issue Reporting Policy
- Financial Fraud Reporting Procedure
- Global Privacy Program
- Political Contributions Policy
- International Trade Policy

All actual or suspected incidents of corruption must be reported within 24 hours or as soon as reasonably possible.

For more information see Alcoa 2022 Sustainability Report page 25.

Political contributions

Alcoa's Political Contributions Policy prohibits the use of company funds, property, services or other items of value for political purposes. Rare exceptions may be made, such as favouring or opposing a ballot or referendum vote that can impact the company. Alcoa Corporation did not make any direct donations to the election campaigns of politicians in 2022.

Cyber security

Cyber attacks, security breaches and related system failures have the potential to disrupt operations and business processes, and impact our stakeholders. Global operations require increased reliance on technology, which exposes AWAC to risks of theft of proprietary information, including trade secrets and other intellectual property.

Alcoa is working to align its global security program with the ISO-27001 Information Security Management standard. Alcoa continues to strengthen systems and security measures, train employees on cyber threats, and enhance security policies relevant to Alcoa and its third-party providers.

Global Privacy Program

The privacy strategy is designed to protect the interests of all employees, customers and third-party suppliers. The collection, storage and use of data, including personal and sensitive information, is governed by Alcoa's Global Privacy Program following legal requirements, regulations and contractual obligations.

The Privacy Program Office adopts a risk-based strategy that includes change management, communication, policies, procedures, technology and training. Alcoa's Data Privacy Standard details the company's approach to complying with international data privacy laws and regulations and defines the procedures that underpin its privacy program.

1. For employees whose specific roles put them at a higher level of risk. **2.** Alcoa-wide data.

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ESG TRANSPARENCY AND DISCLOSURE

Why this matters

Transparency is paramount to maintaining trust, and stakeholder expectations and reporting requirements are increasing. Good ESG performance and up to date disclosure shows both progress and opportunities for improvement.

How this is managed

Alcoa routinely engages with ESG rating organisations and investors to better understand their expectations and reflect their priorities in business activities and disclosures.

Alcoa aligns with international frameworks and standards, which are a crucial tool for robust and comparable measurement and communication of ESG progress.

UN Sustainable Development Goals (SDGs)

Alcoa is committed to the UN SDGs and has aligned its sustainability practice accordingly. Progress against specific SDGs is noted throughout this report, identified by the corresponding SDG icon.

Further details on alignment to the UN SDGs can be found on Alcoa's website.

Industry frameworks

Alcoa is a member of International Council on Mining and Metals (ICMM) and the Aluminium Stewardship Initiative (ASI). As an ICMM member, Alcoa is expected to meet the requirements of ICMM's 10 Principles, eight Position Statements and 38 Performance Expectations (PEs). The ASI Performance Standard outlines 59 sustainability principles and criteria relevant to the aluminium value chain. At the end of 2022, AWAC had eight[3] operating and three non-operating locations certified to the ASI Performance Standard and the Chain of Custody Standard.

In 2020, ICMM and ASI published an equivalency benchmark outlining how the two frameworks align and differ. Based on this, Alcoa developed its own self-assessment approach to promote compliance with both ICMM and ASI requirements.

SEE **COMMUNITY – PARTNERSHIPS FOR COMMUNITY INVESTMENT AND DEVELOPMENT** FOR FURTHER DETAILS →

By September 2022, all AWAC operating locations had conducted the self-assessment to the ICMM PEs. The assessment found that 94 percent of applicable PEs had been met, with the remaining six percent partially met. These include the following, for which corrective action plans have been established[4]:

- Environmental performance
- Biodiversity and water management
- Responsible production
- Local economic opportunities
- Stakeholder engagement.

Industry relations

In addition to the ICMM and ASI, Alcoa and/or Alumina Limited, maintains membership of and participates in a range of organisations that drive collaboration and engagement on issues important to the aluminium and mining industries:

- Australian Aluminium Council
- Brazilian Aluminium Association
- Brazilian Council for Sustainable Development
- Center for Climate and Energy Solutions
- Eurometaux
- European Aluminium
- International Aluminium Institute
- The Aluminum Association.

Certification and assurance

Selected information from Alcoa's 2022 Sustainability Report has been subject to limited assurance conducted in alignment with the International Standard on Assurance Engagements (ISAE) 3000 and ISO-14064:3. This included indicators relating to Scope 1, 2 and 3 greenhouse gas emissions; energy consumption; water inputs, consumption, and discharges; waste; mine disturbance and rehabilitation, occupational safety and health; and community complaints; together certain ICMM Subject Matters. The assurance statement, conducted by ERM CVS, can be found in the Alcoa 2022 Sustainability Report Appendix B, pages 131–134. Alumina Limited also has policies and processes in place to confirm the integrity of periodic corporate reports such as the Sustainability Update.

The approvals process includes review and sign off on material statements by a number of internal groups, including the appropriate senior executives within the function responsible for the report and legal review.

3. Operating locations excludes Portland ASI Performance Standard certification grant in H1 2023. Non-operating locations includes MRN which was divested in H1 2022. **4.** Alcoa-wide data.

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SUPPLY CHAIN MANAGEMENT

Why this matters

Robust supply chain management is a critical component of good governance and spans every aspect of sustainability, from greenhouse gas emissions to human rights. AWAC has a significant and diverse supply chain, which gives rise to risks, but also presents opportunities for AWAC to drive positive impact across its value chain.

How this is managed

In line with a commitment to drive environmental and social progress, AWAC's procurement approach considers the entire life cycle of the goods and services purchased. The strength of AWAC supply chains hinges on building long-term relationships with suppliers who share its commitment to operate in a responsible and ethical manner.

For more information see Alcoa website.

Responsible Sourcing Program

The Responsible Sourcing Program is a risk-based decision framework integrated into how AWAC identifies, selects, contracts and manages the goods and services it procures. ESG is integrated throughout the procurement process.

The Responsible Sourcing Program is supported by the following KPIs:

- ESG risk screening of all potential suppliers, contractors and business partners
- Further due diligence through a digital and evidence-based audit to relevant suppliers
- Percentage of suppliers improving their ESG maturity rating year on year
- Average supplier ESG maturity rating compared to the EcoVadis benchmark

The Supplier Sustainability Program supports and monitors suppliers' performance. It comprises:

Assess	All potential and contracted suppliers are screened through EcoVadis IQ, MK Denial, and in some cases TRAC.
Audit and mitigate	Low/medium risk strategic suppliers or annual spend >US$5M and higher risk suppliers are required to complete EcoVadis Ratings Audit. Higher risk suppliers with audit score <24 for human rights are candidates for Supplier Site Collaboration Program: onsite audits focusing on human rights, commencing in 2023.
Advance	Help suppliers implement improvement plans, set key performance objectives and develop strategic partnerships to manage risk and create long-term value. Suppliers are continuously monitored using 360 Watch, a part of the EcoVadis platform.

The effectiveness of the Supplier Sustainability Program is monitored through audit scores, improvement plans and 360 Watch findings, as well as leading indicators that help transform AWAC supply chains for the better.

All suppliers are expected to meet Alcoa's Supplier Standards, which set out the expectations for suppliers, contractors and other business partners.

In 2022 the Responsible Sourcing Program was enhanced through an intensified focus on human rights and social performance. Actions included:

- Expanding reporting through EcoVadis 360 Watch to track and monitor human rights controversies.
- Launch of the Supplier Site Collaboration Program to work more closely with suppliers to together build awareness around, identify, and remedy human rights concerns.
- In partnership with WalkFree, working with the Human Rights Resources and Energy Collaborative to develop a remediation framework and frequently asked questions guide to support the implementation of onsite human rights audits.
- Launch of two training modules for procurement teams, focused on the Responsible Sourcing Program and supply chain human rights. These are available to all employees through the OnDemand Procurement University.

Additionally, in line with the London Metal Exchange's responsible sourcing requirements, in 2022 Alcoa initiated the assessment and tracking of key raw materials to identify any from conflict-affected and high-risk areas. All of AWAC's LME-listed brands met the required performance criteria.

See page 51 for information on AWAC's broader approach to human rights.

The Responsible Sourcing Program also addresses environmental impacts of our supply chain, including Scope 3 emissions, waste and water consumption.

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Performance over 2022

2022 Supply chain spend by region

Region	Supply chain spend US$ Billions	Supply base composition†	Audited spend‡
Australia	2.58	21	51
South America*	2.27	18	50

* Alcoa-wide data.
† Percentage of total supply base.
‡ Percentage of suppliers who have taken the EcoVadis ratings audit.

Supplier Sustainability Program[5]

- More than 9700 suppliers (97 percent of Alcoa's global supply base) were assessed, with 127 identified as higher risk and required to undertake further due diligence through an EcoVadis Ratings audit.
- More than 1000 suppliers completed the EcoVadis Ratings audit. This represents 47% of Alcoa's supply spend and includes the 127 higher risk suppliers.
- Less than 39% were completing it for the first time
- 69% of reassessed suppliers improved their score
- 99% of audited suppliers met the minimum score of 25 out of 100

Supplier audits highlights:

- 62% have an active whistleblower procedure
- 48% are taking action to promote diversity
- 82% have obtained access to EcoVadis Academy

EcoVadis Benchmark: Overall score for Alcoa suppliers out of 100[5]

2020	2021	2022
47.9	48.6	50.9

The 2022 average score of 50.9 is 14 percent above the global EcoVadis network benchmark (44.6) and an improvement of 2.3 percent on the results from 2021.

Component scores:

51.3
ENVIRONMENT

53.4
LABOUR AND HUMAN RIGHTS

50.9
ETHICS

42.0
SUSTAINABLE PROCUREMENT

5. Alcoa-wide data.

During the year, EcoVadis 360 Watch uncovered potential controversies relating to suppliers:[5]

- two potential discrimination and harassment instances
- nine potential industrial relations issues
- two potential human rights concerns.

Alcoa's Supplier Sustainability Program aims to work more closely with suppliers to together build awareness, identify, and remedy human rights concerns.

Alcoa itself was awarded the Platinum supplier classification from EcoVadis for the 2021/2022 reporting period, putting it in the top 1% of companies of over 200 assessed globally. The rating recognises Alcoa as an industry leader across the following sustainability categories: environment, labour & human rights, ethics, and sustainable procurement.

Supplier inclusion and diversity

The Supply Chain Inclusion and Diversity Strategy, established in 2021, works to build awareness and education, both internally and externally, of the benefits of a more inclusive and diverse supply chain, including increasing the participation of people from underrepresented or underserved groups.

In 2022, Alcoa partnered with TealBook, a global database of suppliers that enables AWAC to identify and recruit new suppliers from underrepresented or underserved groups. TealBook is free for suppliers to register and share their ownership structure, employee mix and supply chain partnerships.

Alcoa seek to educate all suppliers on inclusion and diversity, through measures such as specific tender questions and regional partnerships. In 2022, Alcoa launched the Alliance Alcoa program, which brings its largest onsite suppliers together to discuss and understand how they can collectively increase diversity within the workforce.

To support local spend, Alcoa is reviewing local and Indigenous procurement policies in operating regions, in accordance with Alcoa's Indigenous Peoples Policy and Innovate Reconciliation Action Plan (RAP).

TECHNOLOGY AND INNOVATION

AWAC aims to use technology and innovation to advance aluminium industry sustainability and stand out from its competitors.

Refinery of the Future initiative is being developed to reduce carbon footprint of alumina refining process through MVR and EC technologies.

To support customers also meet their sustainability goals, Alcoa launched Sustana™ line of products which includes a low-carbon alumina brand, EcoSource™.

For information on Alcoa's approach to technology and information, see the Alcoa 2022 Sustainability Report pages 41-43.

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SOCIAL

People and communities constitute the foundation of how AWAC operates.

AWAC fosters a culture where employees feel empowered, respected, and valued. AWAC relies on its teams and local communities to thrive and reciprocates by contributing to enhance their wellbeing.

AWAC is committed to pursuing to grow in tandem with the communities we operate in, through stakeholder engagement, shared value creation and optimisation of closed or curtailed mining operations.

SAFETY AND HEALTH

Why this matters

Alcoa operations inherently pose health and safety hazards, so maintaining the physical and mental wellbeing and safety of all employees and contractors is a board-level priority. 'Care for People' is a core Alcoa value.

How this is managed

AWAC is committed to health and safety before any other priorities, Through Care for People Value, we reinforce the goal that anyone who works at or visits its facilities returns home safe and healthy. AWAC promotes a universal safety culture, supported by risk management and safety systems that aim to prevent all forms of accidents and injuries. The health and wellbeing of all employees is monitored to prevent illnesses and help them perform at their best.

Safety

AWAC has a systematic approach to EHS risk assessment and management at all locations, using critical controls to prevent or mitigate EHS incidents. Alcoa's EHS Policy sets out the expectation that its systems comply with all laws, and relies on internal systems to improve standards for the company and suppliers where unacceptable risks are identified. The policy sets out four strategic long-term goals:

- Protect the health and safety of the global workforce
- Zero accidents
- Net zero emissions
- Occupational disease prevention.

AWAC's safety culture is continually evolving, supported by feedback from the safety and incident reporting program. The executive team and other senior leaders regularly review corrective actions and the effectiveness of controls, share good practices and learnings, and sponsor company-wide hazard mitigation initiatives.

Each location is responsible for developing a registry of all significant safety hazards, and works to either eliminate the hazards or implement controls to prevent or mitigate the associated risks. Safety is always top of mind for all locations, and AWAC is proud of a global directive that enables any employee to 'Stop for Safety.'

In 2022, after an extensive review, AWAC began updating its safety systems and standards. This update, which will continue into 2024, intends to make operations safer through streamlined standards and tools for managing critical risks. As part of this update, Alcoa communicated new expectations for leaders to spend meaningful time in the field, engaging more closely with front-line employees.

Fatality risk management is a fundamental aspect of AWAC's safety system. In 2022, the critical control field verification process was retooled, with new checklists that are specific to unique risk profiles, helping to verify that critical controls are in place to protect lives.

To make safety a universal goal, the OneAlcoa safety approach and comprehensive contractor management framework applies to all temporary workers, contractors and visitors as well as permanent employees.

Harassment and bullying

AWAC has policies to comply with all country and local laws prohibiting harassment, and follows Alcoa's Code of Conduct and Harassment and Bullying Free Workplace Policy, which prohibit all forms harassment in the workplace, including harassment and bullying behaviour by or to employees, contractors, vendors, customers, suppliers or visitors. Violations of the code and supporting policies are not tolerated and may result in disciplinary action or termination of employment. Training modules for salaried employees include respect in the workplace training that covers expectations for leaders, a help chain to report concerns, and potential consequences for failing to address inappropriate behaviours.

Health

Health hazards inherent in Alcoa operations to various degrees include chemical, physical (noise, ergonomic, radiation, heat and vibration), biological and other types of hazards.

AWAC's health vision is to: prevent occupational disease through exposure controls, support personal health and wellbeing through AWAC workplaces and culture, and operate in a manner that does not negatively impact the health of host communities.

To achieve this, AWAC has implemented a four-pillar framework (below) supported by a suite of internally developed global health standards.

HEALTH HAZARD CONTROLS

Preventing occupational disease

COMMUNITY AND PUBLIC HEALTH

Maintaining AWAC's social license to operate

PERSONAL HEALTH AND WELLBEING

Enhancing personal health and wellbeing

HEALTH STATUS AND FITNESS FOR WORK

Ensuring an employee's health status is compatible with assigned work

AWAC applies a hierarchy of controls to reduce and work towards eliminating such hazards (see on the next page), and employs advanced approaches and technologies, such as real-time personal physiological monitoring to gauge heat-stress risks.

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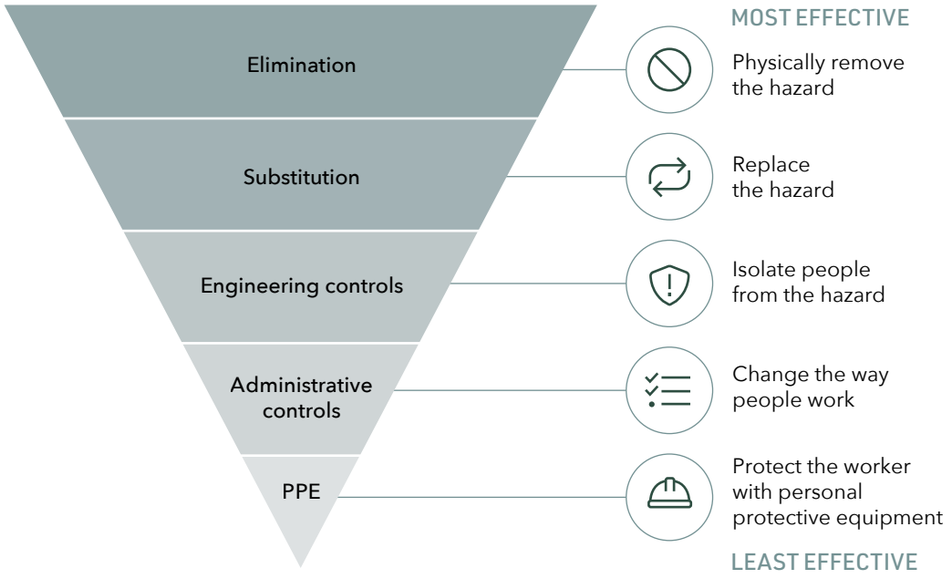
Hierarchy of controls



Source: National Institute for Occupational Safety and Health

Engaging with employees and contractors to understand the hazards and risks of their daily work is central to the health strategy. Engagement channels include daily toolbox talks, annual hazard communication training, periodic topical updates and quarterly EHS reports.

Most AWAC locations offer comprehensive onsite occupational medicine services to support employees to perform their work confidently and safely.

Worker fatigue remains a significant risk factor in global mining operations. In 2022 AWAC continued to close gaps in its global Fatigue Risk Management Standard and applied the standard to all operations. New preventive and mitigating technology controls, including microsleep detection and fatigue data analytics, were also established at several high-risk operating locations. After a successful run, these controls were incorporated into the standard.

AWAC offers voluntary programs to promote and support personal health and wellbeing. Two of the most successful wellbeing programs are the Thrive at Work initiative in Australia, a holistic, prevention-oriented approach to mental health at work; and the Viva Vida program in Brazil, which encourages employees to adopt and maintain healthier habits and lifestyles through various initiatives.

Company-wide health initiatives include:

- Employee assistance programs
- Traveller and expatriate health, safety and security
- Return-to-work programs
- Fatigue risk management

Employees can also access non-occupational medical and healthcare services through company-provided medical plans, which are aligned based on local and regional circumstances.

Performance over 2022

AWAC's fatal and serious injury/illness potential (FSI-P) rate was 0.48 incidents per 100 full-time workers, representing a 11 percent decrease compared to 2021. This is attributed to proactive, transparent reporting and improved calibration of risk perception across the company, and is a positive reflection of the healthy risk management system.

AWAC's Total Recordable Incident Rate, Lost workday rate and Days away, restricted and transferred rate all increased slightly from 2021 to 2022. In 2023, there will be a continued effort on eliminating fatalities and preventing injuries through focused initiatives.

Comprehensive safety data can be found in the Data Pack.

Total Recordable Incident Rate, employees and supervised contractors (full facility)*

Region	2021	2022
Global	1.14	1.20

* Total recordable incident rate represents the number of injuries and illnesses resulting in days away from work, job transfer or restriction, medical treatment or other recordables per 100 full-time workers.

*Lost workday rate (full facility)**

Region	2021	2022
Global	0.30	0.34

* Lost workday rate represents the number of injuries and illnesses resulting in one or more days away from work per 100 full-time workers.

*Days away, restricted and transfer rate (full facility)**

Region	2021	2022
Global	0.65	0.71

* Days away, restricted and transfer rate includes lost workday cases plus cases that involve days of restricted duty and job transfer per 100 full-time workers.

In 2022, Alcoa continued its involvement in a multiphase project initiated by the International Aluminium Institute (IAI) and co-sponsored by the Aluminium Stewardship Initiative (ASI), focusing on the health impacts of climate change and ensuring the resilience of operations and adjacent communities. The project began at AWAC's Alumar site in Brazil and includes developing health literacy materials (funded by a grant from the Alcoa Foundation), an asset-level assessment tool and other support materials.

COVID-19 case reporting was discontinued at the end of September 2022, by which time cases across AWAC locations had dwindled and preventative practices had been embedded into standard operating procedures.

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HUMAN RIGHTS

Why this matters

Alcoa operates across diverse communities and regions worldwide. Respect for the interests, cultures, and customs of employees and stakeholders across our value chain is vital to AWAC's social licence to operate.

How this is managed

The Alcoa Human Rights Program is the central mechanism that guides AWAC's approach to respecting human rights in our operations and supplier partnerships around the world. The program includes the Human Rights Policy, due diligence, grievance and remediation mechanisms.

The Human Rights Policy prohibits the use of all forms of forced labour and human trafficking. AWAC is committed to supporting the United Nations Guiding Principles for Business and Human Rights and the International Labor Organization Conventions, as well as the ICMM Principle 3 performance expectation to 'Respect human rights and the interests, cultures, customs and values of employees and communities affected by our activities'. The policy operates in conjunction with the:

- Code of Conduct and Ethics covering human rights and informing employee training
- Indigenous Peoples Policy respecting rights holders and fostering a journey toward reconciliation
- Social Policy and our vision to create sustainable value in the communities where we have a presence
- Supplier Standards explicitly indicating respect for human rights
- Supplier Sustainability Program (see further pages 47-48)
- Equal Employment Opportunity Policy
- Harassment and Bullying Free Workplace Policy
- Integrity Line for employees, suppliers and the general public to report potential violations or concerns.

The Alcoa Human Rights Council is sponsored at the executive level and includes representatives from each key resource unit and region. Members meet regularly to provide feedback to the Executive Team and to discuss objectives and strategies to integrate human rights throughout company functions and external interactions.

The Human Rights Policy is operationalised through the Human Rights Management Standard, which defines clear roles and responsibilities for different layers of the organisation. The Standard incorporates a due diligence process, including robust stakeholder engagement practices. This process allows individuals to provide input on their relationship with AWAC and the effectiveness of established grievance mechanisms (see further page 53).

For information about managing human rights in AWAC's supply chain, see page 47.

Performance[6]

At the end of 2022, Alcoa had completed human rights impact assessments (HRIAs) for 18 operating locations. In 2022 this included AWAC's Portland smelter, with particular focus on the effectiveness of grievance mechanisms for internal and external human rights–related concerns.

The HRIAs identified the following salient risks:

- Free prior and informed consent
- Cultural heritage
- Dam failure impacts on stakeholders
- Stakeholder security and human rights
- Contractor working conditions
- Absence of onsite supplier audits related to human rights.

Action plans have been developed to address these risks, with progress being monitored by the Human Rights Council.

In 2022 Alcoa joined the Voluntary Principles on Security and Human Rights (VPSHR) and began implementing its core tenets across Brazilian operations. In addition, the Alcoa Global Security Team began providing training on the VPSHR to leadership teams, contract security forces, and public security forces across operations in Brazil.

A human rights component was also incorporated into the monitoring of non-controlled joint ventures.

6. Alcoa-wide data.

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INDIGENOUS AND LAND-CONNECTED PEOPLES

Why this matters

Alcoa operates in the homelands of Indigenous Peoples who have specific needs, concerns and aspirations regarding their heritage and traditions. Over the long history of its operations and through generations representing varying and increasing levels of cultural awareness, AWAC has affected the rights and lives of those people in ways we might not fully appreciate or understand.

How this is managed

The Alcoa Indigenous Peoples Policy sets out AWAC's commitment to recognise and respect the diversity, cultures, customs and values of the Indigenous and other land-connected peoples at sites where exploration, ongoing mining operations and closures are taking place. The Policy is underpinned by international human rights principles set out in the Universal Declaration of Human Rights, the International Labour Organization's Declaration on Fundamental Principles and Rights at Work, the United Nations Global Compact and the United Nations Guiding Principles on Business and Human Rights.

AWAC is committed to abide by all applicable laws and regulations as well as the principle of free, prior and informed consent, and other tenets of the International Labour Organisation's Indigenous and Tribal Peoples Convention, and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).

Wherever possible, AWAC seeks to establish support for new activities within affected Indigenous communities through independently monitored dialogue, collaborative accommodation of each other's interests and formal agreements.

Performance

In 2022 Alcoa of Australia launched a second, 'Innovate', Reconciliation Action Plan (RAP) to help AWAC build relationships, respect and opportunities for Aboriginal and Torres Strait Islander peoples. The RAP was developed in consultation with Aboriginal stakeholders, and includes 15 actions with more than 70 deliverables to reach by June 2024, which aim to forge more inclusive and resilient communities. The Alcoa Foundation[7] contributes to this goal by supporting employment and business opportunities in Western Australia.

In Brazil, AWAC engages traditional communities through a land use agreement.

For instance, AWAC signed a mining easement agreement with the Association of Communities of the Juruti Velho Region (ACORJUVE) in 2018. The agreement included landowner rights, royalties and compensation for any loss and damages to communities. In 2022 federal and state prosecutors revoked their recommendation for a foundation to manage the community's mining revenues (compensation and royalties), which are now required as direct payments for families (60 percent) and ACORJUVE (40 percent). As a result, AWAC expects to pay compensation for the 2006 to 2010 period in 2023. Loss and damage studies for the period 2011 to 2025 will start in 2023 and continue until 2024. To govern this process, AWAC holds monthly meetings with ACORJUVE via a joint management committee.

In 2022, AWAC also signed a mining easement agreement with the Association of Gleba Curumucuri Communities (ACOGLEC). Under the agreement, AWAC will make a one-time payment per hectare we occupy and invest in socio-environmental projects in the area annually. Also, established a management committee to create a permanent channel for purposeful dialogue and stronger relations between the parties.

Also in 2022, AWAC signed a mining easement agreement with the Association of Prudente and Monte Sinai Communities (ACOPRUMS) that includes a payment covering 123 hectares (304 acres) for the entire 20 years of easement.

Although AWAC ceased mining operations in Suriname in 2015, it continues to engage with Indigenous communities as the mining sites are rehabilitated. In 2022 local community development and capacity building initiatives were supported through both corporate funding and grants from the Alcoa Foundation.

7. Community investment through Alcoa Foundation, not part of AWAC but investing in AWAC operating locations communities.

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LOCAL COMMITMENT WITH COMMUNITIES

Why this matters

Alcoa's operations can have both positive and negative impacts on the communities where we operate, so AWAC's social license to operate is directly correlated with the health and economic stability of our local communities. Effective stakeholder engagement, community partnerships and local investment are therefore essential to our continuing operations.

How this is managed

AWAC's community impact strategy aims to understand the needs and aspirations of local communities and support their wellbeing. In this, AWAC is guided by:

- the Alcoa values
- the Ethics and Compliance Program, encompassing:
  - Code of Conduct and Ethics
  - Human Rights Policy
  - Indigenous Peoples Policy
  - Social Policy
  - Social Management System (SP360).

Social Performance was one of three new Centres of Excellence established in 2022, to raise standards across the company (see further page 44).

The Social Performance CoE supports the implementation and integration of the Social Management System, 'SP360', across AWAC locations. It is also responsible for developing and overseeing social management standards and providing regional and location-specific support for related activities.

SP360 provides a blueprint to facilitate effective engagement with communities, manage social risks and maintain AWAC's social license to operate at all our locations. It is aligned with global leading practices including the ICMM Social Economic Reporting Framework, which Alcoa, as an ICMM member, participated in developing throughout 2022.

SP360 comprises four standards:

- Social performance management
- Indigenous and land-connected peoples
- Cultural heritage management
- Human rights management.

Implementation of SP360 began in AWAC mining communities in Western Australia and Juruti, Brazil in 2021, and will continue rolling out across all AWAC locations throughout 2023.

Alcoa measures its social performance through the ICMM Socio Economic Reporting Framework and Aluminium Stewardship Initiative (ASI) Performance Standard self-assessment.

Stakeholder engagement

Effective commitment with communities depends on transparent and regular stakeholder engagement to establish a mutual understanding of historical contexts, existing concerns, and future opportunities.

Stakeholder engagement is overseen by the Safety, Sustainability and Public Issues Committee of the Alcoa Board, and guided by SP360, with a focus on community risks, opportunities, and feedback. AWAC employees maintain regular engagement with host communities through one-on-one interactions, community consultation forums comprising a cross section of local representatives, and surveys.

Stakeholder engagement is also an important part of human rights due diligence, allowing stakeholders to provide input on their relationship with AWAC and the effectiveness of established grievance mechanisms. The Alcoa Integrity Line, a confidential, country-specific grievance mechanism, is set up to receive and address complaints. AWAC is committed to investigate, address and respond to the concerns raised and take corrective action where needed.

Performance

Number of community complaints raised through local grievance mechanisms in 2022:[8]

Region	2022
Australia	100
Brazil	55

The following key issues were raised by, or discussed with stakeholders in 2022:

LOCATION	ISSUES AT OPERATIONAL SITES
Anglesea, Victoria	Groundwater use while filling the coal mine pit
Kwinana, Western Australia	Health and amenity impact of air-quality buffer
Portland, Victoria, Australia	Welfare of koalas in the smelter plantation
Pinjarra, Western Australia	Dust management from refinery
Juruti, Brazil	Increase in rainwater during the wet season
São Luís, Brazil	Community raised issues
San Ciprián, Spain	Energy costs stemming from smelting operations

LOCATION	ISSUES AT NON-OPERATIONAL SITES
Paranam, Suriname	Litigation measures relating to contract issues for Surinam pensioners.
Point Comfort, USA	The remedy for the EPA's Record of Decision 2001 has been achieved.

See further details in the Data Pack.

Facility stewardship and transformation

Careful planning for the eventual closure and transformation of AWAC facilities is a key consideration throughout the life cycle of each asset. Working actively with local stakeholders, AWAC's goal is to transform closed assets for reuse or redevelopment, generating new opportunities, jobs and tax revenues.

To enable the success of project transformations, AWAC actively engages with government agencies, community representatives, and other relevant parties on post-operation strategies to optimise the land and assets.

In cases where remediation is required, protection of human health and the environment is the primary objective. Environmental conditions are scientifically assessed to identify remedial solutions that are protective, compliant, feasible and compatible with current or future uses, as well as our stakeholders' interest.

Performance

In 2022, AWAC spent US$67 million on stewardship and transformation projects at current and former operating locations. This included spending on mine reclamation, environmental remediation, closure of residue disposal areas, holding costs, demolition and landfill closure.

See Data Pack for details on AWAC's Transformation Projects.

8. Alcoa-wide data.

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INCLUSION, DIVERSITY AND EQUALITY

Why this matters

Part of showing the world what a sustainable aluminium company looks is providing opportunities to enlist the skills and talents of everyone. Gender equality is an intrinsic value of every successful organisation, but also important is to build a workforce that is diverse in underrepresented groups related to ethnicity and disability.

How this is managed

AWAC's approach to inclusion, diversity and equality (IDE) is set out in Alcoa's global values, Equal Employment Opportunity Policy, and Code of Conduct. To drive continual improvement, in 2022 Alcoa launched its Everyone Culture framework and Global IDE Policy. Throughout the year, Alcoa evaluated its IDE progress to drive measurable and sustainable change, and identified three focus areas:

- Strengthen foundations
- Build awareness
- Drive accountability.

This work was informed by internal governing bodies consisting of:

- the Global Inclusion, Diversity & Equity Council (GIDEC)
- inclusion groups
- local committees.

The inclusion groups, each sponsored by a member of the Executive Leadership Team, play an essential role in building a more inclusive workplace. Groups include:

- Alcoa Women's Network (AWN)
- Employees at Alcoa for Gay, Lesbian, Bisexual and Transgender Equality (EAGLE)
- Alcoans Working Actively for Racial-Ethnic Equality (AWARE)
- Alcoans moving Beyond Limited Expectations (ABLE).

The Everyone Culture framework marks an important enhancement phase for AWAC's Trusting Workplaces training, and advances its mission to create an inclusive workplace that is safe, respectful, accepting and free from any form of harassment, bullying and offensive or disrespectful conduct.

In 2022 there was a company-wide effort to promote IDE awareness and engagement through various resources and channels, including monthly newsletters. This was complemented by training opportunities including supervisor training in IDE concepts, unconscious bias and cultural competencies.

The 'Everyone Matters' voluntary self-identification initiative was launched in 2021 to build a more complete picture of AWAC's workforce. In 2022, the initiative helped AWAC and its communities by optimising branding materials to be more inclusive, exploring new opportunities to increase diversity at global events, and analysing IDE data to support inclusion groups.

Read more about Alcoa's IDE programs and initiatives.

Performance over 2022[9]

AWAC has made significant headway in IDE over the last few years. In 2022, 51.26 percent of new hires were from underrepresented groups. Driven primarily by the restart of the smelter in Alumar, Brazil, this result exceeded internal targets of 33 percent of underrepresented hires as well as the 38.06 percent of new diversity hires registered in 2021.

See more on AWAC's recruitment approach under 'Talent attraction', page 55.

In 2022, three out of eight Alcoa executive team positions were held by women. This ratio is above the industry average of 12.1 percent. The overall representation of females in Alcoa grew from 17.17 percent in 2021 to 18.48 percent.

In 2022 Alcoa's fourth third-party gender pay equity analysis was conducted on salaried employees. Findings included:

- **Pay within band (equal pay for same job level) by country and functional area:** Two percent gender pay gap, which is considered pay parity
- **Pay gap (overall equity in earnings):** 17 percent gender pay gap, which is the overall gap irrespective of country, functional area or job level. This gap is due primarily to the distribution among women throughout the various levels of the organisation

Other IDE performance highlights included:

- Alcoa was named in the 2022 Bloomberg Gender-Equality Index and received a score of 90[10] on the Human Rights Campaign Foundation's Corporate Equality Index 2021.
- Alcoa of Australia organised an awareness event in honour of International Day Against Homophobia, Biphobia, Interphobia & Transphobia (IDAHOBIT). The event celebrates LGBTQIA+ people globally and raises awareness about the work still needed to combat bias and discrimination.
- AWAC launched two programs in Brazil to support the recruitment and retention of women and individuals with disabilities. AWAC also launched the first cohort of the ENABLE training program that promotes the development of people with disabilities and amplifies representation and awareness at all levels.

For more information on diversity and inclusion, see Alcoa 2022 Sustainability Report, page 67-71.

9. Alcoa-wide data. **10.** Out of 100 possible points.

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TALENT ATTRACTION, RETENTION AND DEVELOPMENT

Why this matters

To remain competitive, AWAC must aim to be an employer of choice. Employee engagement and development is central to upholding employee satisfaction and maintaining motivation towards the company purpose of turning raw potential into real progress.

How this is managed

Talent attraction

Attracting the next generation of AWAC employees is a fundamental task that involves continually expanding and diversifying employment outreach. Local communities have become an important focus for recruitment efforts. Recruiting events at colleges and universities have identified emerging local talent, and internships and apprenticeship programs have further developed AWAC's workforce. AWAC has also increased its presence at community engagement events and promotes opportunities through direct communications, such as mail drops and newsletters.

In Australia, a partnership with the Waalitj Foundation helped to attract local Indigenous candidates, as part of the latest Reconciliation Action Plan. In Brazil, partner organisations were engaged to recruit individuals with disabilities. Outreach efforts include sharing information about available opportunities with community leaders, as well as recruitment campaigns targeting specific groups. As a result, the number of applications from self-declared candidates rose.

To maintain diversity as a cornerstone of AWAC hiring practices, hiring managers and interviewers are provided with training, and tips on conscious and unconscious bias.

AWAC's global onboarding process was also revamped in 2022, to offer a seamless, tech-enabled experience for both new hires and their hiring managers.

Talent retention

In 2022, Alcoa conducted its second company-wide employee engagement survey. The survey allows us to understand employees' opinions and concerns, assess current and emerging trends, and make sustainable progress as an organisation. Following the survey, leadership teams identified opportunities for improvement, which included additional staff coaching and development, as well as location-specific and departmental needs.

Survey highlights[11]

- 60% participation
- 75% overall engagement score
- Top three strengths: intent to stay, work-life balance, authenticity
- 10,000 unique comments and suggestions

AWAC's total rewards program offers financial and non-financial rewards to employees. For some salaried employees, 30 percent of the annual incentive compensation plan was linked to non-financial metrics focused on safety, as well as inclusion and diversity.

For more information, see Alcoa 2022 Sustainability Report, page 74.

AWAC is committed to paying wages that support a normal standard of living; a living wage studied carried out in 2021 identified no gaps.

Labour relations

AWAC believes in freedom of association and actively engages with various unions across global operations. In 2022, Alcoa had 31 active labour agreements covering approximately 70 percent of its workforce.[11]

Talent development

AWAC continually invests in the tools and skills that employees need to develop. In 2022 key areas of focus were:[11]

- The People Development Process (PDP), which involves meaningful check-in conversations between employees and managers.
- Modern learning solutions. More than 1,200 employees enrolled in voluntary online courses, supported by curated learning recommendations. The completion rate was 65 percent.
- The Transformational Leadership Development program, which was expanded to South America following its successful launch in Australia and Europe in 2021. Nearly 50 individuals had participated in the program by the end of 2022.
- Gigs initiative, where employees can apply for short-term assignments outside their normal routine, creating more than 100 short-term development opportunities

Average learning hours and training spend per person per full-time equivalent[11]

- 4 formal classroom hours
- $398 spent on tuition reimbursement (US$)[12]

11. Alcoa-wide data. **12.** 2022 numbers for employee training show a decrease from 2021. Where in 2021 we calculate average number of training hours only factoring employees who participated in training throughout the year, in 2022 we updated our updated our calculation formula to using Alcoa's total global headcount to calculate average training hours. Our decline in average spend on training per employee was due to vendor management cost savings.

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ECONOMIC CONTRIBUTION

Creating shared value with the communities where AWAC operates is key to maintaining its social license to operate. AWAC endeavours to achieve this through:

- Providing stable, fair-paying jobs
- Procuring goods and services from local suppliers when possible
- Paying income and other taxes
- Investing in community initiatives.

Tax transparency

AWAC builds social and economic value across various countries and regions. Timely and transparent tax payments help to build trusted relationships with local communities and governments where AWAC operates. Alcoa's Tax Policy commits AWAC to work in good faith with the tax laws and regulations in every country of operation and meet reporting and tax requirements.

Alcoa is a signatory to the Extractive Industries Transparency Initiative (EITI) and a member of the International Council on Mining and Metals (ICMM). The ICMM framework aims to promote enhanced transparency of mineral revenues and give stakeholders, such as investors, governments and local communities, access to consistent and comparable data on contributions to social and economic development. ICMM members have committed to disclosing taxes paid on a country-by-country basis beginning in 2025. Alcoa has elected to provide this information on a regional basis. In Australia, Alcoa is a signatory to the government's Voluntary Tax Transparency Code.

Partnerships for community investment and development

Partnerships are a prerequisite to addressing complex social or environmental challenges in AWAC's local communities. The Alcoa Foundation and Instituto Alcoa are separate entities from AWAC, but aim to create sustainable value for the communities where AWAC operates by offering grants to local and regional partners through not-for-profit organisations.

In 2022 the Alcoa Corporation committed to a new strategic goal in collaboration with Alcoa Foundation and Instituto Alcoa: By 2030, AWAC locations will see increased investment in access to skills development, to better equip individuals to participate in economic activities. Progress associated with this social performance goal will be disclosed in accordance with ICMM's Socio Economic Reporting Framework.

Performance

Value added by AWAC to host communities[13]

Economic value US$ billions	**Australia**	**South America**
Labour costs*	0.5	0.1
Procurement spend	2.6	2.3
Income taxes^	193.9	19.9

* Labour costs include compensation and benefits for employee services rendered plus employee expenses for external training, transfer and relocation, expatriate costs, workers' compensation, travel, recognition and rewards, medical expenses, meals, recruitment, transportation, education, work clothes and other employee-related expenses.

^ Income tax amounts are net of income tax refunds received and exclude various other taxes.

Tax payments from Alcoa's four active bauxite mining locations

	Income tax US$ millions	**Royalties** US$ millions	**Fringe benefits tax** US$ millions	**Payroll tax** US$ millions
Government of Australia	193.9	0.0	0.4	0.0
State of Western Australia	0.0	55.3	0.0	26.6
State of Victoria	0.0	0.0	0.0	1.1
Australia total	**193.9**	**55.3**	**0.5**	**27.7**
Brazil[13]	**7.0**	**10.0**	**0.0**	**4.9**

For more information see Alcoa 2022 Sustainability Report page 60.

2022 Economic support provided to Alcoa's operating communities

Foundation	**Financial contribution** (US$ millions)
Global outreach (Alcoa Foundation)*	6.2
Brazil (Instituto Alcoa)*	1.3
Australia (Harvey Waroona Sustainability Fund)†	3.8

* Alcoa Foundation and Instituto Alcoa are separate entities from AWAC, but support AWAC operating locations communities.

† The Alcoa Harvey Waroona Sustainability Fund is a partnership between Alcoa of Australia, the Shire of Waroona and Shire of Harvey to facilitate successful collaboration between Alcoa and the communities of Harvey and Waroona.

13. Alcoa-wide data.

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ENVIRONMENT

Primary aluminium production has the potential to cause a range of environmental impacts, from greenhouse gas emissions to water consumption. AWAC prioritises mitigation and remediation processes and works to restore ecosystems that may be impacted by its operations. AWAC is also working to develop and adapt technological advancements that can help reduce the environmental footprint of its operations.

CLIMATE CHANGE

Why this matters

Traditional aluminium production is an energy-intensive process that generates significant GHG emissions. AWAC, and the industry more broadly, must work to reduce these emissions.

How we manage this

See pages 21-39 for disclosures on Alumina's approach to climate change and greenhouse emissions, aligned to the Task Force on Climate-related Disclosures (TCFD). Below we summarise elements of Alcoa's approach to managing climate change and greenhouse emissions for AWAC.

Governance

In 2022, Alcoa established a Climate Change Centre of Excellence (CoE) that brings together a range of experts to provide strategic climate leadership and advice, informing decision making and ensuring cross-functional alignment with Alcoa's Climate Change Policy. The Climate Change CoE reports through the Global Vice President for Sustainability to Alcoa's Sustainability Governance Board (SGB).

Strategy

Alcoa's global strategy to reduce GHG emissions uses the hierarchy of mitigation: eliminate, reduce, substitute and offset. This strategy is aligned with achieving a below 2°C global warming scenario by 2050.

AWAC's approach to climate change and greenhouse emissions is discussed on pages 21-39 of this report. This includes disclosures aligned to the TCFD through the lens of Alumina Limited.

Performance over 2022

Overall Scope 1 and 2 GHG emissions intensity for both smelting and refining decreased. Factors contributing to a reduction in smelting emissions intensity included continued energy upgrades at the Portland Aluminium smelter.

GHG intensity and emissions

GHG intensity – Tonnes of GHG per tonne of production

Year	2021	2022
Smelting/Refining*	14.080	13.876
Refining	0.516	0.510
Smelting	13.10	12.91

* Calculated as smelting intensity + (1.9 x refining intensity).

GHG emissions (tonnes CO_2e)

GHG	2021	2022
Direct (Scope 1)	7,707,201	7,407,806
Indirect (Scope 2)	3,842,402	3,812,435
Total (Scope 1 & 2)	11,549,603	11,220,241
(Scope 3)*	40,857,356	45,561,604

* Scope 3 has been calculated on an Alcoa control basis; hence it excludes emissions associated with smelting of AWAC alumina in Alcoa smelters.

Scope 3 emissions

To better understand AWAC's full value chain emissions impact, in 2022 the scope 3 inventory was expanded to include all fifteen categories as defined by the World Resources Institute (WRI) GHG Scope 3 Protocol. Category 14 (Franchises) was deemed not applicable.

In 2022 AWAC's Scope 3 emissions were 45.6 million metric tonnes. Downstream emissions represent about 86 percent of the total, of which almost 94 percent originate from the processing of sold products.

Scope 3 inventory scope has been expanded every year, together with improvements to quality based on more primary data. Although year-on-year emissions are not directly comparable, scope 3 emissions increased in 2022 primarily due to heightened emissions in the Processing of Sold Products and Fuel, Energy Related Activities and Purchased Goods & Services categories.

Alcoa is reviewing upstream and downstream activities for reduction opportunities, as well as engaging with customers and suppliers to enhance inventory accuracy and support target-setting opportunities.

AIR QUALITY

AWAC works to reduce air emissions and their associated impacts by continually improving operational stability and utilising add-on technologies where applicable. AWAC follows Alcoa's global standard, which defines the minimum requirements to maintain compliance with applicable air emission regulations and address potentially adverse impacts on the environment and community. Refer to the Data Pack for mercury emissions intensity.

For further information, see the Alcoa 2022 Sustainability Report pages 109–110.

*Emissions**

Tonnes

	2021	2022
SO_2	14,578	15,144
NOx	11,819	11,325
Hg	1,796	1,663

* 2021 Hg emissions have been revised since the previous sustainability update (from 1,788 t to 1,796 t).

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ENERGY USE AND EFFICIENCY

Why this matters

Refining and smelting activities are inherently energy intensive. AWAC operations require access to high volumes of competitively priced and reliable energy supplies.

How this is managed

AWAC is working to improve energy efficiencies and decrease consumption through operational improvements and technological advances. Well-defined short- and mid-term energy efficiency targets are integrated into Alcoa's overall GHG emissions reduction target. Energy reporting is based on management controls defined by the Greenhouse Gas Protocol, together with data from the IPCC Guidelines and country-specific database, such as the Australian National Greenhouse and Energy Reporting (NGER) Scheme.

Energy security

Alcoa purchases large quantities of natural gas and electricity. Around 40 percent of Alcoa's natural gas and 80 percent of its electricity are secured under arrangements that exceed 10 years.[14]

The Portland smelter is AWAC's largest consumer of electricity. To achieve the Alcoa target of 85 percent renewable use by 2025, AWAC is looking to secure new contracts for the smelter with larger renewable energy sources. AWAC is also initiating discussions with a range of potential partners to use renewable energy and biofuels throughout its mining operations.

To support the energy security of AWAC's host communities, facilities voluntarily participate in demand response initiative programs.

This involves adjusting AWAC's electricity consumption in a location to maintain local grid stability during peak demand periods.

Demand response in large baseload industries like aluminium smelting is becoming increasingly important due to rising energy costs and the growing share of solar and wind generation.

Energy efficiency

AWAC's energy efficiency approach aims to reduce consumption through operational efficiency and technological advances. The approach has four pillars:

BENCHMARKING

Identify opportunities to compare operations with industry leaders.

UNIVERSITY COLLABORATIONS

Develop energy efficient solutions.

BEST PRACTICE SHARING

CoEs share best practices throughout the company to foster operational improvements.

LOCATION-SPECIFIC TARGETS

Set and monitor energy efficiency targets for each location and develop an implementation roadmap, accounting for process variations between facilities.

Alcoa invests in research and development and partners with regional energy suppliers to identify opportunities to reduce energy consumption.

Performance over 2022

AWAC's total energy consumption decreased marginally compared to 2021, thanks in part to energy upgrades to the Portland Aluminium smelter. AWAC energy intensity slightly increased 2.2% (75.1 Gj per metric tonne of production) compared to 2021 due to operational challenges in Western Australia.

Energy efficiency of AWAC assets

Gigajoule (Gj) of energy required per tonne of production

AWAC assets	2021	2022
Mining (bauxite)	0.08	0.09
Refining (alumina)	9.03	9.07
Smelting (aluminium)	55.49	56.85

Direct energy consumption (mines, refineries and smelter)

Gigajoule (Gj)

Refer to the Data Pack for additional detail by source.

AWAC's proportion of electricity drawn from renewables continues to improve due to Alcoa's investments in renewable energy sources.

Indirect energy consumption by source (mines, refineries and smelter)

Gigajoule (Gj)

	2021	2022
Electricity (non-renewable)	11,977,619	11,715,238
Electricity (renewable)	6,638,306	8,275,247
Total electricity	18,615,924	19,990,484
Steam	12,290,212	12,851,970
Total indirect energy	**30,906,136**	**32,842,455**
Renewables %	**36%**	**41%**

14. Alcoa-wide data

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IMPOUNDMENT AND WASTE MANAGEMENT

Why this matters

The by-products of mining and refining can pose potential risks to surrounding communities, so it is a priority for AWAC to manage these safely and effectively at active, inactive and closed sites.

How this is managed

AWAC follows rigorous protocols to supervise the design, construction, operation, and closure of storage impoundments, drawing on decades of collaborative experience. These facilities primarily store two types of material: washed bauxite mine tailings and bauxite residue, both generically referred to as 'tailings'. Alcoa has set a 2030 strategic long-term goal of 15% reduction of bauxite residue land storage requirements per metric tonne of alumina produced from 2015 baseline.

AWAC follows Alcoa's mandated Global Impoundment Policy, which is aligned with internal standards, all applicable local legal requirements, the Global Industry Standard on Tailings Management (GISTM), and the International Council of Mining and Metals (ICMM) mandated requirements. AWAC works to minimise its impact and, when possible, rehabilitate the land for further productive use.

For more information on impoundment construction and design, risk assessment, management, closure and rehabilitation, see the Alcoa 2022 Sustainability Report pages 90-94.

Bauxite residue

AWAC's three refineries have long-term strategies for the effective management of bauxite residue. Globally, Alcoa is exploring a multi-faceted approach towards zero bauxite residue. This includes reducing the amount of residue that is produced during the refining process, along with exploring reuse opportunities in collaboration with external organisations and universities, including:

REDUCING RESIDUE VOLUMES	
Beneficiation	Screening out ore that does not contain aluminium oxide before it goes through the refining process.
Bauxite residue filtration technology	Reducing the moisture content of the bauxite residue, allowing easier handling and storage.
Solar drying	Using solar drying to move away from traditional "wet" storage of bauxite residue.
REUSE OPPORTUNITIES	
Red Sand™ opportunities	Converting residue into a commercially marketable construction product.
ReActiv project	Transforming residue into a reactive material suitable for low-carbon cement products.
IAI collaboration on bauxite residue into cement	Identifying potential pathways to adopt residue in cement production and use.
IAI collaboration on bauxite residue into a soil-like medium	Transforming in-situ bauxite residue into a soil-like medium.

To read more about these efforts, see Alcoa's global focus on designing the Refinery of the Future™.

Performance over 2022

AWAC's bauxite residue storage efficiency has improved steadily over recent years, with a cumulative 15.6% reduction of land required against the 2015 baseline. This surpasses Alcoa's 2030 strategic long-term goal of 15%. In 2022, AWAC generated 22.78 million metric tonnes of bauxite residue. The bauxite residue intensity is measured in tonnes per tonnes of alumina produced, which in 2022 reached 1.62 tonnes, an increase from 1.58 tonnes in 2021, due to reduced bauxite grade.

Bauxite residue storage efficiency[15]

	2021	2022
Square meters of land required per thousand tonnes of alumina produced	45.3	44.9

Bauxite residue intensity

	2021	2022
Metric tonnes of residue per metric tonne of alumina produced	1.58	1.62

Waste management

Alcoa's long-term waste goal is a 15 percent reduction in landfilled waste by 2025 and 25 percent by 2030 from a 2015 baseline. The goal focuses on moving from landfill disposal to recovery, and prioritises opportunities to reduce, reuse and repurpose waste by utilising the waste minimisation hierarchy (see under *Circular economy* below).

AWAC's Waste Management Standard requires all sites to have a waste management plan, which is reviewed at least every three years and must include waste minimisation strategies.

Supplier waste generation is assessed as part of Alcoa's Supplier Sustainability Program and Supplier Standards, and comprehensive assessments are also undertaken for third parties receiving industrial waste or by-products from AWAC facilities.

AWAC has mitigation measures in place to prevent and manage potentially damaging spills, including emergency response plans to protect people and the environment in the event of a spill. There were no major spills recorded in 2022.

For more information on Alcoa's approach to waste management, see the Alcoa 2022 Sustainability Report pages 118-120.

Performance over 2022

Landfilled waste[16]	2021*	2022
Tonnes (t)	9,257	9,054

* Increased waste was due to Huntly and Willowdale locations sending PFAS remediated soils to landfill, process overhaul work at Wagerup and additional construction related waste at Alumar.

Circular economy

Additionally, AWAC is launching its circular economy program to identify further upstream and downstream opportunities. From raw material extraction, to manufacturing, to product end of life, AWAC aims to continuously improve circularity in its value chain.

The waste optimisation program, launched in 2021, focuses on 10 material types of waste. An example project is converting mining tyres into rubber crumb and steel. AWAC is also exploring ways to transform SPL (spent pot lining) into raw materials or fuel sources for other commercial uses, such as the cement and steel industries. In 2022, the Portland smelter recovered 13,754 metric tons of SPL.

15. Data calculated on an Alcoa basis; however, it relates predominantly to AWAC assets as over 95% of bauxite and alumina assets in the Alcoa portfolio are owned by AWAC. **16.** Bauxite residue, refining process waste and fly ash, are excluded from landfilled waste data as these waste streams are managed separately through onsite storage and impoundments. Overburden and rock generated from AWAC's mining activities are also omitted and not considered waste because the materials are reused for mine rehabilitation.

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BIODIVERSITY AND MINE REHABILITATION

Why this matters

AWAC's operations are disruptive to natural environments. It is our responsibility to minimise our environmental footprint, protect biodiversity, and sustainably rehabilitate the land we use for the environment and local communities. Protecting biodiversity is also enshrined in Alcoa's commitments to the ICMM and the UN SDGs.

How this is managed

Biodiversity

AWAC's commitment and approach to managing biodiversity impacts and dependencies are detailed in Alcoa's Biodiversity Policy and Biodiversity Standard. For new sites and major expansion projects Alcoa's goal is to achieve 'No net loss of biodiversity'. AWAC recognises designated protected areas, and does not explore, mine, or otherwise operate in World Heritage sites. It is also committed to avoiding the development of new operations within protected areas under International Union for Conservation of Nature (IUCN) categories Ia, Ib, II or III.

17. Alcoa-wide data.

In 2022, Alcoa developed a new biodiversity Centre of Excellence, responsible for developing policies and standards, setting strategic goals and defining and tracking key performance indicators.

AWAC's approach to biodiversity management is guided by the mitigation hierarchy, prioritising avoidance and minimisation of impacts. A key mitigation focus in areas disturbed by bauxite mining is to progressively return the land to an agreed post-mining condition, including restoring native vegetation.

AWAC has developed and implemented biodiversity action plans at all operating sites identified as adjacent to protected areas or within those of high biodiversity value. All other locations have a plan in effect or in development.

Each biodiversity action plan:

- Identifies the biodiversity within areas of direct management control or significant influence, including the presence of listed threatened species and communities, in context with surrounding land.
- Assesses potential impacts, both positive and negative.
- Develops actions to minimise biodiversity impacts and sets targets to monitor progress.
- Informs and engages stakeholders on biodiversity actions and outcomes.

In 2022 Alcoa began revising its Biodiversity Standard to formally integrate minimum expectations for managing impacts and dependencies on priority ecosystem services (benefits obtained from natural ecosystems that can be impacted by human activity and require well defined control measures). The revised Standard will be completed in 2023 and implemented in 2024.

Biodiversity surveys provide valuable feedback on the effectiveness of AWAC's management approaches. A 2022 survey at AWAC's Alumar site in Brazil identified more than 150 flora and fauna species, including more than 85 fauna species in a residue storage area closed 30 years ago and subsequently rehabilitated.

For more information, see the Alcoa 2022 Sustainability Report pages 95-98.

A list of operating sites within or adjacent to protected areas or areas of high biodiversity value is located in the Data Pack.

Mine rehabilitation

Planning for rehabilitation begins in the early stages of a mine's development. This includes engagement with community stakeholders and local governments where appropriate. To minimise environmental footprint, AWAC aims to progressively rehabilitate disturbed areas during the mine's operational life and where possible, restore the land back to productive use.

AWAC's goal is to maintain a corporate-wide running five-year average ratio of 1:1 or better for active mining disturbance (excluding long-term infrastructure) to mine rehabilitation. This ratio indicates that the area of rehabilitation and disturbance is the same over a given period of time.

In 2022 a review of the effects of long-term restoration techniques was conducted at AWAC's bauxite mines in Western Australia. The review found that AWAC's 'direct return' technique – collecting a thin surface layer of fresh topsoil and using it in rehabilitation – can improve species richness and plant cover in the long term.

Performance over 2022

In 2022, AWAC had three active bauxite mining areas in Australia and Brazil and several inactive mines that are in the process of final rehabilitation and closure. From 2018 to 2022, Alcoa's ratio of mining disturbance to rehabilitation was 0.82:1, which indicates more areas were rehabilitated or transferred to other land users compared to new disturbances.[5]

Goal: 1:1 for Active Mining Disturbance[17]

Running five-year average

1	1
MINE REHABILITATION	ACTIVE MINING DISTURBANCE

2022 Progress: 0.82:1 for All Mine Assets

2018-2022

1	0.82
MINE REHABILITATION	ACTIVE MINING DISTURBANCE

*Mining land disturbed/Land rehabilitated**

Hectares

Indirect energy source	2021	2022
Open mine area (total)	14,748	14,822
Area disturbed (annual)	670	1,037
Australia	472	379
South America	198	658
Area rehabilitated (annual)	902	963
Australia	614	511
South America	287	453

* The values in this table include some of Alcoa's South American operations that do not form part of AWAC operating locations. However, the vast majority of disturbance and subsequent rehabilitation is the result of AWAC's mining and infrastructure activities.

'Area disturbed' means land used in each reported year for mining or for mining infrastructure (e.g. roads, shops, crushing equipment, conveyors).

Area rehabilitated means land returned to natural conditions or to productive use (such as farming) after mining or decommissioning of mine infrastructure in each reported year.

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WATER STEWARDSHIP

Why this matters

Water is a key raw material within Alcoa operations, particularly for ore processing, cooling, dust suppression and potable uses. Due to its valuable and often scarce nature – intensified by the growing impacts of climate change – water stewardship is one of the most important material issues for AWAC and its stakeholders.

How this is managed

AWAC strives to sustainably manage the water resources in and around our facilities and comply with all applicable environmental requirements in the countries where we operate. Alcoa's long-term goal is to reduce the intensity of total water use from Alcoa-defined water-scarce locations by five percent by 2025 and 10 percent by 2030, using a 2015 baseline.

AWAC's priorities for water management are outlined in Alcoa's Water Stewardship Policy, supported by our Water and Wastewater Management Standard, which is aligned with ICMM's Position Statement on Water Stewardship.

The Standard requires location-specific water management plans that consider:

- Climate change and water stress
- Current and alternative water sources
- Water quality
- Security of water supplies
- Water reduction, substitution, reuse and recycling programs
- Water resource contamination risks and mitigating actions, considering local context and receiving water bodies
- Other water impacts, such as erosion, acidification and salinisation
- Action plans for higher-risk aspects, which are reviewed at least every five years.

Water-related risks and opportunities are also factored into AWAC's long-term planning process and capital management system.

A review of AWAC's water stress assessment began in 2022, with a plan to complete catchment and operational water risk assessments in 2023, reviewing physical, regulatory and reputational risks, supported by the World Wildlife Fund Water Risk Filter Tool.

Based on this review to date, together with an earlier assessment, five facilities currently meet Alcoa's definition of water-scarce locations, all in Western Australia.

In 2022, we partnered with industry peers to complete a water supply study in Western Australia. This identified future water supply impacts and opportunities, with a focus on recognising and supporting local, cultural and ecological values. The findings will shape AWAC's future water supply strategies for facilities within this water-scarce region.

For further details on water stewardship, see the Alcoa 2022 Sustainability Report pages 102–108.

Performance over 2022

In 2022, AWAC reported a 2.3 percent increase in water use intensity in water-stressed areas. This was primarily due to lower production at the Pinjarra and Kwinana refineries. Factors such as bauxite quality influence the amount of water required to produce alumina.

Total water use intensity* – locations in AWAC-defined water-stressed areas^

Cubic meters of water per metric tonne of alumina produced

2015 (baseline)	2021	2022
3.79	3.51	3.59

* The baseline and intensity values have been adjusted to reflect the 2022 removal of Alumar Refinery from the definition of an Alcoa-defined water-scarce location. Mining is included at a ratio of 2.85 metric tons of bauxite to 1.0 metric tons of alumina.

^ Locations meeting Alcoa's definition of water scarce locations (applying the World Resource Institute's Aqueduct tools) are the Huntly and Willowdale mines in Western Australia, and the Kwinana, Pinjarra and Wagerup refineries, also in Western Australia.

Freshwater withdrawal

Millions of cubic meters

Source	2021	2022
Total	29.6	27.5

Freshwater intensity (Refining and smelting combined)*

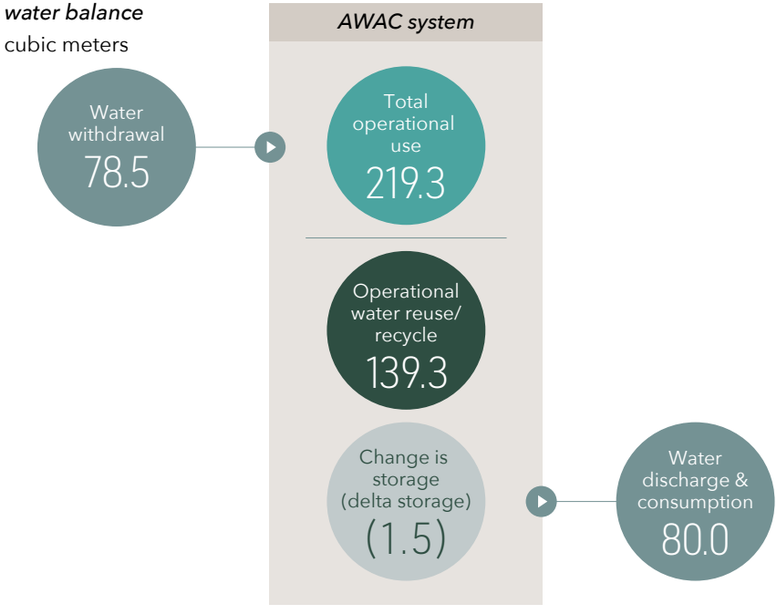
Cubic meters/tonne of production

	2021	2022
Mining	0.1	0.2
Refining	1.6	1.4
Smelting	1.0	1.2
Total intensity (refining and smelting)*	**4.0**	**3.8**

* Calculated as smelting intensity + (1.9 x refining intensity).

AWAC water balance

Million cubic meters



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ASX
The Australian Securities Exchange (ASX) is the primary stock exchange in Australia.

CDP
Abbreviation of Carbon Disclosure Project. It is an international non-profit organisation that operates a global disclosure system for investors, companies, cities, states and regions to manage their environmental impacts.

CO_2e
Abbreviation of carbon dioxide equivalent. It is a metric measurement used to compare the emissions from various greenhouse gases based on their global-warming potential (GWP) by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.

CRU
Abbreviation of Commodities Research Unit. CRU Group is a leading business intelligence and market analysis company specialising in the global metals, mining, and fertilizer industries.

EcoSource
EcoSource is Alcoa's brand of alumina made with a low greenhouse gas emitting process. It has a carbon footprint that is no higher than 0.6 metric tonne of carbon dioxide equivalents per tonne of alumina produced.

ESG
Abbreviation of Environmental, Social and Governance. It is a framework used to evaluate the sustainability and ethical impact of organisations.

GHG
Abbreviation of greenhouse gases. They are gases present in the Earth's atmosphere that contribute to the greenhouse effect. Common greenhouse gases include water vapor (H_20), carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (0_3), and fluorinated gases.

GRI
The Global Reporting Initiative is an independent, international organization that helps businesses and other organisations take responsibility for their impacts, by providing them with a global common language to communicate those impacts.

H1 / H2
H1 stands for the first half of the year and H2 stands for the second half of the year. Thus, H1 corresponds to January, February, March, April, May, and June. H2 corresponds then to July, August, September, October, November, and December.

ICMM
Abbreviation of International Council for Mining and Metals. It is an international industry association with an aim to improve sustainable development in the mining and metals industry.

IFRS
Abbreviation of International Financial Reporting Standards. They are globally recognised accounting standards that provide a framework for consistent and transparent financial reporting.

IPCC
The United Nations Intergovernmental Panel on Climate Change is the United Nations body for assessing the science related to climate change. It was created to provide policymakers with regular scientific assessments of climate change, its implications, and potential future risks, as well as to put forward adaptation and mitigation options.

NDC
The Nationally Determined Contribution (NDC) is a climate action plan to reduce greenhouse gas emissions and adapt to climate impacts. Each country that is a party to the Paris Agreement is required to establish and update every five years.

NMA
Abbreviation of non-metallurgical grade alumina. This type of alumina is utilised in applications such as ceramics, catalysts, abrasives, and specialty chemicals.

OTC markets
Abbreviation of Over-the-counter markets. They are decentralised financial markets where trading occurs directly between parties without a formal exchange.

Paris Agreement
The Paris Agreement is a legally binding international treaty on climate change. It was adopted in 2015 at the Conference of the Parties (COP) and the agreement covers climate change mitigation, adaptation, and finance.

RCP
Abbreviation of Representative Concentration Pathways. They are scenarios used in climate modelling to project future greenhouse gas concentrations. The RCPs consider various socio-economic and technological factors to estimate different pathways and their potential impact on climate change.

Safeguard Mechanism
The Safeguard Mechanism is the Australian Government's policy that sets legislated limits (known as baselines) on the greenhouse gas emissions of Australia's largest industrial facilities.

SASB
The Sustainability Accounting Standards Board guide the disclosure of financially material sustainability information by companies to their investors. The standards identify the subset of environmental, social, and governance issues most relevant to financial performance in each industry.

Scope 1 emissions
Scope 1 emissions refer to direct greenhouse gas emissions as a result of an activity, or series of activities at a facility level owned or controlled by the organisation. This includes emissions produced from industrial processes, burning fuel on vehicles owned by the organisation, etc.

Scope 2 emissions
Scope 2 emissions represent indirect greenhouse gas emissions resulting from the generation of purchased electricity, heat, or steam consumed by an organisation. These emissions occur outside the organisation's operational boundaries but are associated with its activities.

Scope 3 emissions
Scope 3 emissions are indirect greenhouse gas emissions that occurs as a result of an organisation's activities in the wider economy but are not classified as Scope 2. These include emissions from supply chain, business travel, employment commuting, the use and disposal of products.

SDGs
United Nations Sustainable Development Goals, also known as the Global Goals, are a collection of 17 interlinked objectives designed to action to end poverty, protect the planet and improve the lives and prospects of everybody everywhere.

SGA
Abbreviation of smelter-grade alumina. This type of alumina refers to a high-purity product used as a feedstock in the production of primary aluminium.

TCFD
Abbreviation of Task Force on Climate-related Financial Disclosures. It provides a framework to disclose climate-related risks and opportunities. TCFD aims to enhance transparency and enable better-informed decision-making regarding climate-related issues for investors, lenders, and stakeholders.

TNFD
Abbreviation of Task Force for Nature-related Financial Disclosures. It provides a framework for organisations to report and disclose their impacts and dependencies on biodiversity loss and ecosystem degradation. Similar to TCFD, the TNFD seeks to improve the transparency and accountability of financial institutions and companies regarding their nature-related risks and opportunities.

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DISCLAIMER

Summary information

This Sustainability Update contains summary information about the current activities of Alumina Limited (ACN 004 820 419) (**Alumina**) and its subsidiaries as at the date of this Sustainability Update. The information in this Sustainability Update should not be considered to be comprehensive nor to comprise all the information that a reader may require in order to make an investment decision regarding Alumina securities. This Sustainability Update should be read in conjunction with Alumina's other periodic and continuous disclosure announcements lodged with the ASX, which are available at **www.asx.com.au**.

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