ALUMINA LIMITED

2018
Sustainability Update

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In 2018 we undertook an assessment of our sustainability and climate-related risks and opportunities to better inform our strategy and disclosures.

Contents

About this report

Welcome to Alumina Limited's 2018 Sustainability Update. This report is designed to provide stakeholders with a description of the economic, social and environmental performance of Alumina Limited's joint venture investment in AWAC (Alcoa World Alumina and Chemicals), our global joint venture with Alcoa, the manager/operator of the AWAC operations.

This update supports Alumina Limited's commitment to report on non-financial performance as outlined in our sustainability policy and our commitment to high-levels of transparent disclosure. It is designed for review by all stakeholders in Alumina Limited though more especially for the investment community including institutional and retail shareholders who are interested in the long-term sustainability of Alumina Limited.

The report concentrates on the sustainability impacts of the AWAC business. The aim of the report is to give easy access to consolidated information about AWAC's sustainability performance and lead to greater understanding about the quality and value of these assets.

REPORTING BOUNDARY AND SCOPE

This Report covers the AWAC assets jointly owned by Alumina Limited and Alcoa Corporation. That includes assets wholly owned by AWAC and assets that AWAC holds less than 100 per cent equity interest but are managed by Alcoa. Excluded is AWAC's 25.1 per cent interest in the Ma'aden alumina refinery and bauxite mine in Saudi Arabia. Also excluded are AWAC's equity interest in the MRN bauxite mine in Brazil and the CBG bauxite mine in Guinea.

This update includes full facility results from the AWAC assets (unless indicated otherwise) to provide readers with a more meaningful overview of AWAC's assets.

Unless otherwise stated, the information presented is on a continuing basis and discontinued operations basis during the operating period 1 January 2018 to 31 December 2018.

The Operations Map on pages 8 and 9 identifies all the facilities that are included in the scope of this report.

All financial data is expressed in US dollars and environmental data is metric.

To aid understanding and comparability with Alcoa's Sustainability Report, as well as those of other resources companies and associated industries, the report's content is informed by GRI Standards 2016. The standards that are wholly or partially reported are listed in the GRI index, page 54.

LIMITATION OF THIS REPORT

Alumina Limited is the non-operating joint venture partner in AWAC and is dependent on Alcoa (joint venture manager/operator) to provide the data necessary to respond. The AWAC assets are a subset of Alcoa's entire business operations. Where possible, Alcoa provides Alumina Limited with AWAC information however, some information gaps appear due to the difficulty in separating out AWAC specific information.

More information on sustainability at Alcoa's integrated aluminium operations is available through Alcoa's Sustainability Report.

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The aim of the report is to give easy access to consolidated information about AWAC’s sustainability performance.

AWAC OWNERSHIP

Alumina Limited 40%

Alcoa 60%

GUIDE TO ENTITY REFERENCES

Three main entities are mentioned throughout this sustainability report - Alumina Limited, AWAC and Alcoa Corporation. To aid the reader's understanding, we have described each entity's role below as well as the rationale for when these entities are referred to in the report.

Alumina Limited

Alumina Limited is the non-operating partner in the AWAC joint venture of which it owns 40 per cent. As this is an Alumina Limited sustainability report to stakeholders, the organisation is sometimes referred to in the first person (we, ours).

Alumina Limited is a publicly listed company, one of Australia's top 100 Australian Securities Exchange (ASX) listed companies and is also traded on the OTC Market in the US as an American Depositary Receipt. The Company is focussed on delivering value to shareholders through our strategic participation in AWAC.

Alumina Limited's offices are located on Level 12, IBM Centre, 60 City Road, Southbank (Melbourne) Victoria 3006 Australia. The Company is a non-operating partner in AWAC and has 11 employees.

AWAC

AWAC (Alcoa World Alumina and Chemicals) is the joint venture enterprise owned jointly by Alumina Limited (40 per cent) and Alcoa Corporation (60 per cent). This enterprise includes global bauxite, alumina and selected aluminium assets.

AWAC references are used to 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, AWAC's 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).
- legally the joint venture is conceived as an unincorporated joint venture based on Agreements between Alumina Limited and Alcoa Corporation. Alumina Limited holds direct ownership in some operating entities of the AWAC enterprise.

AWAC produces and sells alumina, bauxite and aluminium into the global market. Refer to the operations map on pages 8 and 9.

Aloca Corporation

Alcoa Corporation (Alcoa) owns 60 per cent of the AWAC joint venture and is the operating manager of the enterprise. Based on this role, references to Alcoa are used in relation to joint venture partner undertakings as well as actual on-site management of AWAC facilities, including:

- The management team and employees who carry out day-to-day activities;
- Policies, procedures and processes that are applied to everyday activities at AWAC operations.

MEASUREMENT TECHNIQUES

Alumina Limited as a non-operating joint venture partner relies on the data measurement techniques and bases of calculations employed by AWAC's manager/operator, Alcoa. Alcoa uses a variety of internal standards and data collection systems, as well as a rigorous internal and external audit process. Alcoa conform to external data reporting standards, such as the Carbon Disclosure Project, and comply with government statutes like the US Sarbanes-Oxley Act.

Alcoa as manager/operator of the AWAC enterprise, are responsible for the data management, data collection and calculation of sustainability metrics such as CO2 emissions. Alcoa engaged First Environment Limited to provide limited assurance on their consolidated Scope 1, and Scope 2 greenhouse gas (CO2, CH4, N2O, FPC's and SF6) emissions data (that includes AWAC operations) under ISO 14064, Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions. Limited assurance was also provided for Scope 3 emissions in relation to purchased goods and services; fuels and energy related activities and processing of intermediate products sold to customers. In 2019, Alumina Limited submitted an Investor CDP (Climate Change) report and also a CDP Water Information report in respect of Alumina Limited's equity interest in AWAC for the 2018 operation year.

FEEDBACK

Your comments on Alumina Limited's sustainability reporting are welcome, including feedback on areas for improvement such as:

- Information quality, quantity and relevance
- Visual representation
- Report format and
- Report accessibility.

You can provide your comments via email or through contacting:

Colin Hendry
Assistant Company Secretary

Alumina Limited
GPO Box 5411, Melbourne
Victoria 3001
Australia

Alumina Limited

Chairman and CEO overview

At Alumina Limited we recognise that, as a non-operator joint venture partner, our essential responsibility is an overarching governance and oversight presence. This presence is an obligation we exercise on behalf of our stakeholders and also as a responsible participant in the joint venture.

Our own values and governing policies require us to exercise both governance and oversight of the key material risks that face our business and its sustainable operation.

In 2018 we initiated a review of the current and desired state of the Company's sustainability report; we identified areas for improvement. We also undertook a benchmarking exercise against reports of our peers.

A key element of our overall review was to conduct a reassessment of the material aspects of the business to identify if material elements had changed, positively or negatively and whether our reporting emphasis and risk assessment required modification. The process identified seven material elements plus eight other areas of relevance. These form the basis of this report.

Also, in 2018 we directed our attention to the question of climate change, which was identified as a material issue for the business and our stakeholders. As a result, Alumina Limited issued its Climate Change Position Statement in which we recognised the Intergovernmental Panel on Climate Change (IPCC) assessment of climate change science that warming of the climate is occurring. A copy of our Climate Change Position Statement can be found in the Sustainability section of the Company's web site **www.aluminalimited.com**

We will continue to work with our joint venture partner Alcoa, to consider the best options to address the resilience of the business. For example, water scarcity has been identified as a risk to the business resulting from climate change. A considerable amount of water is used at the Western Australian refineries and several initiatives to reduce water consumption have been developed including the introduction of bauxite residue filtration at the Kwinana and Pinjarra refineries. Residue filtration not only reduces water consumption but also benefits in reducing the amount of land required to store residue.

On health and safety, there were no fatalities at AWAC sites over the recent reporting period and there was a slight improvement in the total recordable incident rate. Strengthening of safety culture is a focus at AWAC operations that has resulted in an overhaul of some existing standards and the creation of new safety standards that we believe will continue to reduce the risk of injury and improve safety.

In 2019 we will continue to redefine and develop our sustainability reporting framework to provide a better insight into the sustainability practices of Alumina Limited and its investment in AWAC.

For further information on sustainability matters, please refer to the detailed content of the 2018 Sustainability Update. We also welcome your feedback regarding the content and detail of information provided.

Mike Ferraro | Chief Executive Officer

Peter Day | Chairman

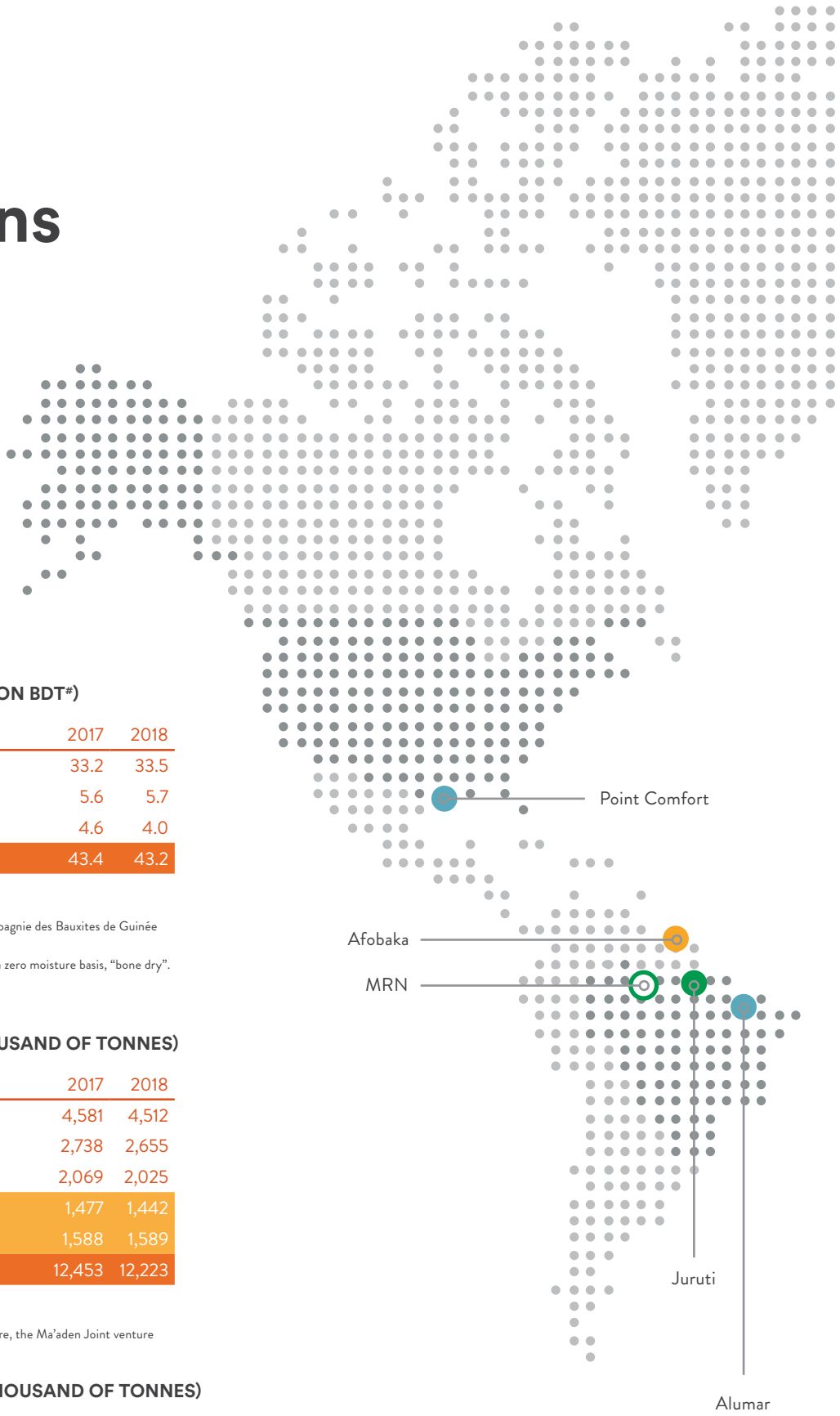
Map of operations

AWAC OPERATIONS

- Bauxite mine
- Refinery
- Smelter
- Location
- Energy

EQUITY INTEREST

- Bauxite mine
- Refinery



BAUXITE PRODUCTION (MILLION BDT#)

	2017	2018
Huntly & Willowdale	33.2	33.5
Juruti	5.6	5.7
MRN* & CBG*	4.6	4.0
Total	43.4	43.2

* AWAC equity share of production.

MRN - Mineração Rio do Norte S.A.; CBG – Compagnie des Bauxites de Guinée are non-AWAC operated mines

Bone dry tonnes (BDT): Tonnes are reported on a zero moisture basis, "bone dry".

The Ma'aden joint venture mine is not included

ALUMINA PRODUCTION (THOUSAND OF TONNES)

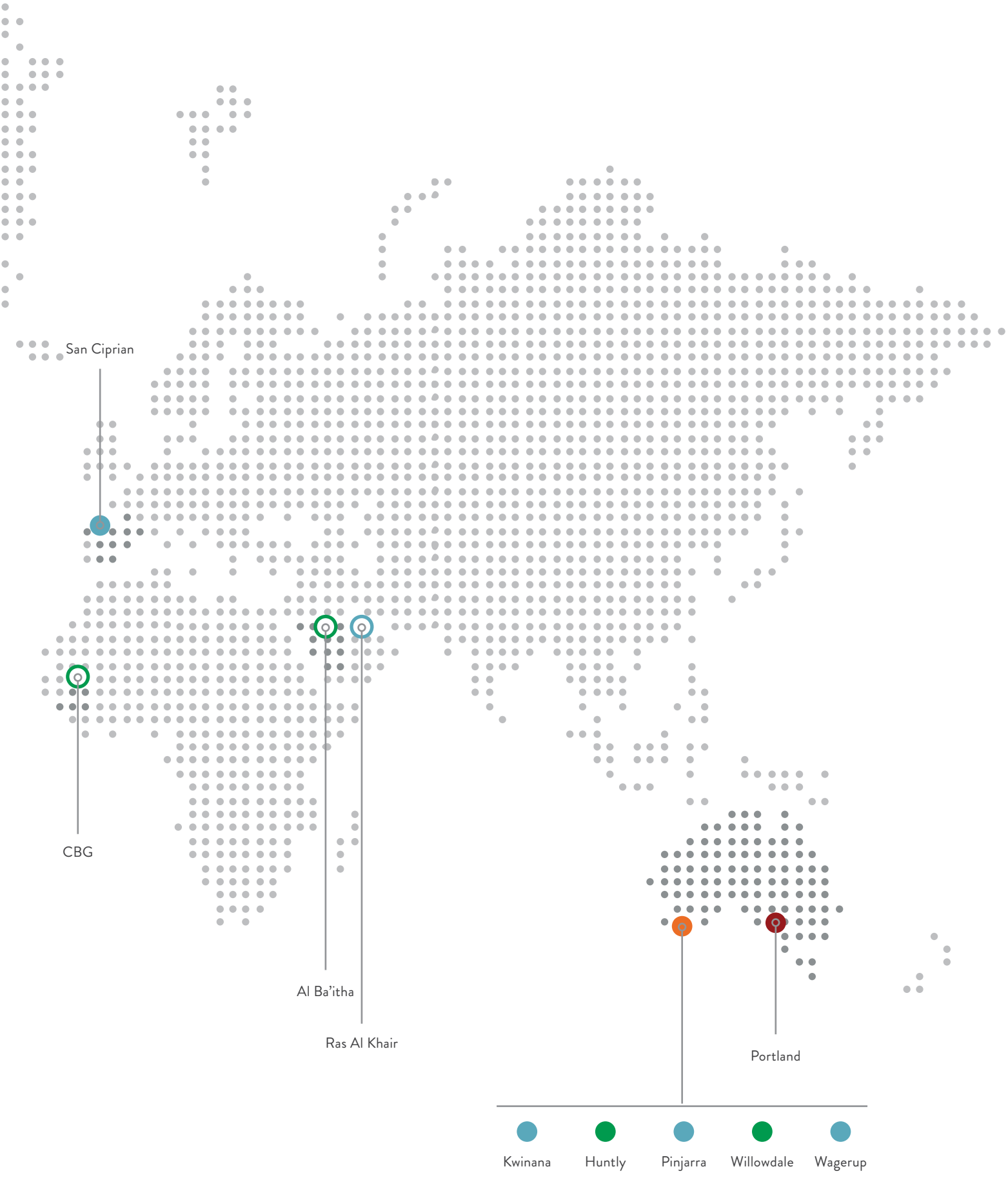
Western Australia Operations	2017	2018
Pinjarra	4,581	4,512
Wagerup	2,738	2,655
Kwinana	2,069	2,025
Alumar*	1,477	1,442
San Ciprian	1,588	1,589
Total	12,453	12,223

* AWAC equity share of production.

Production of AWAC's operated refineries. Therefore, the Ma'aden Joint venture is not included.

ALUMINIUM PRODUCTION (THOUSAND OF TONNES)

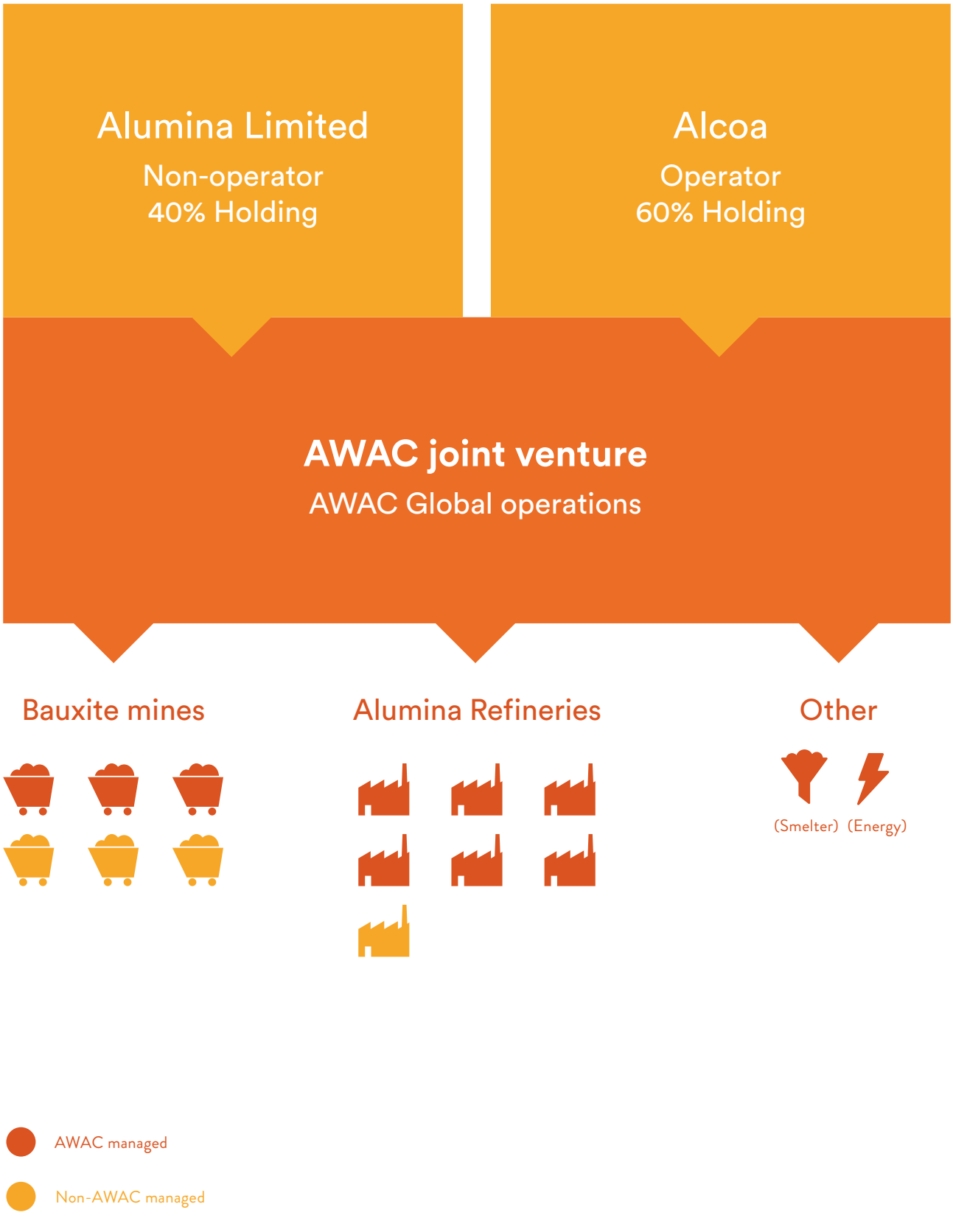
	2017	2018
Portland (AWAC Equity)	112	164


San Ciprian
CBG
Al Ba'itha
Ras Al Khair
Portland
Kwinana
Huntly
Pinjarra
Willowdale
Wagerup

About Alumina

Alumina Limited's single business interest is its non-operating 40 per cent interest in the joint venture, Alcoa World Alumina and Chemicals (AWAC). Alcoa holds the remaining 60 per cent and is the manager/operator.

STRUCTURE


Alumina Limited
Non-operator
40% Holding
Alcoa
Operator
60% Holding
AWAC joint venture
AWAC Global operations
Bauxite mines
Alumina Refineries
Other
(Smelter)
(Energy)
AWAC managed
Non-AWAC managed

Bauxite to aluminium: The process

Alumina Limited's investment in AWAC is primarily in mining of bauxite ore (and rehabilitating mined areas) and processing the ore via a refining process into alumina, the primary raw material used in the production of aluminium. AWAC also has an interest in one aluminium smelter.

01.

ACQUISITION OF BAUXITE RESERVES

Although plentiful, bauxite quality is diminishing, is often not readily accessible and is becoming harder to gain approvals for expansions or new mines. AWAC is the one of the world's largest bauxite producers. AWAC operates mines integrated with alumina refineries in Western Australia and Brazil with interests in non-AWAC operated mines in Brazil and Guinea.

AWAC SUSTAINABILITY APPROACH

AWAC's licence to operate is based on its recognised ability to successfully restore mining sites to their pre-mining condition, re-establishing eco-systems and biodiversity values or, where appropriate, following consultation with local communities and the relevant Government, rehabilitate the land for other productive purposes such as agriculture, commercial, residential or recreational use. Before expanding or commencing a new mine, external consultants are engaged to conduct comprehensive environmental impact assessments.

04.

REFINING

Aluminium does not occur naturally as a metal, but must first be refined from bauxite in its oxide form. Bauxite is generally washed, ground and dissolved in caustic soda (sodium hydroxide) at high pressure and temperature at an alumina refinery. Approximately three to four tonnes of bauxite produces one tonne of alumina and approximately two tonnes of alumina are required to produce one tonne of aluminium. AWAC is one of the world's largest alumina business operating six alumina refineries in several countries, Australia, Brazil, Spain, and the USA (curtailed in 2016). AWAC is a low-cost alumina producer with global alumina production capacity of 14.6 million tonnes per year.

AWAC SUSTAINABILITY APPROACH

Refining alumina is an energy intensive operation therefore key AWAC sustainability targets involve improving energy efficiency and reducing GHG emissions. A strategy is to source operating locations with low carbon-based power. In 2015 the San Ciprian refinery was converted from fuel oil as an energy source to natural gas. AWAC's refineries form part of Alcoa's Global business.

05.

SMELTING

Alumina is converted into aluminium by dissolving it in an electrolytic bath of molten cryolite (sodium aluminium fluoride) within a large carbon or graphite lined steel container known as a "pot". An electric current is passed through the electrolyte at low voltage, but very high current. Molten aluminium is deposited at the bottom of the pot and is siphoned off periodically. It can be blended to an alloy specification, cleaned and then generally cast. AWAC operates one aluminium smelter located at Portland in Australia with a 55% equity capacity of 197,000 tonnes of metal.

AWAC SUSTAINABILITY APPROACH

The process of aluminium smelting requires significant amounts of electricity resulting in GHG emissions. Process efforts have been focussed on reducing direct emissions associated with perflurorcarbons (PFCs) in the smelting process and also opportunities to reduce energy intensity.

02.

BAUXITE MINING

AWAC's bauxite deposits are generally extracted by open cut mining from strata, typically some 4-6 metres thick under a shallow covering of topsoil and vegetation. The topsoil is removed and stored for later use in restoration of the forest. Generally, there is a layer of capstone that is removed to expose the bauxite ore which is extracted, broken up and transported to refineries for further processing. AWAC is the world's largest bauxite miner and is well positioned with long life mines. AWAC's Huntly mine is the world's largest bauxite mine, supplying bauxite ore to Pinjarra and Kwinana Refineries.

AWAC SUSTAINABILITY APPROACH

Particular care is taken in building roads etc to avoid isolation of wildlife, disruption of streams and critical habitats. Mining operations can alter rainfall runoff patterns and surface and ground water hydrology which can have impacts on stream ecology and biodiversity. These are monitored and managed to preserve biodiversity.

03.

MINE REHABILITATION

Rehabilitation is one of the most important parts of the mining process. AWAC supports the objective of returning mined areas to a sustainable future use. In most cases this means returning disturbed land to the pre-existing flora and fauna condition. Preservation of biodiversity of plant species and fauna species is an important focus and is a major consideration for rehabilitation plans or future use decisions.

AWAC SUSTAINABILITY APPROACH

A key objective at AWAC's mines and bauxite residue areas is to minimise the footprint of disturbed land by implementing a program of progressive land rehabilitation. In the Western Australian mines AWAC has achieved 100 per cent of plant species richness in AWAC's rehabilitated mining areas, the first mining company in the world to achieve that goal.

06.

PRODUCT MANUFACTURE

Aluminium is a very versatile metal that can be manufactured into an enormous variety of products used in everyday applications. From foil to beverage cans, electrical components to building applications and transportation whether light weighting vehicles or used in aircraft manufacture.

07.

RECYCLING

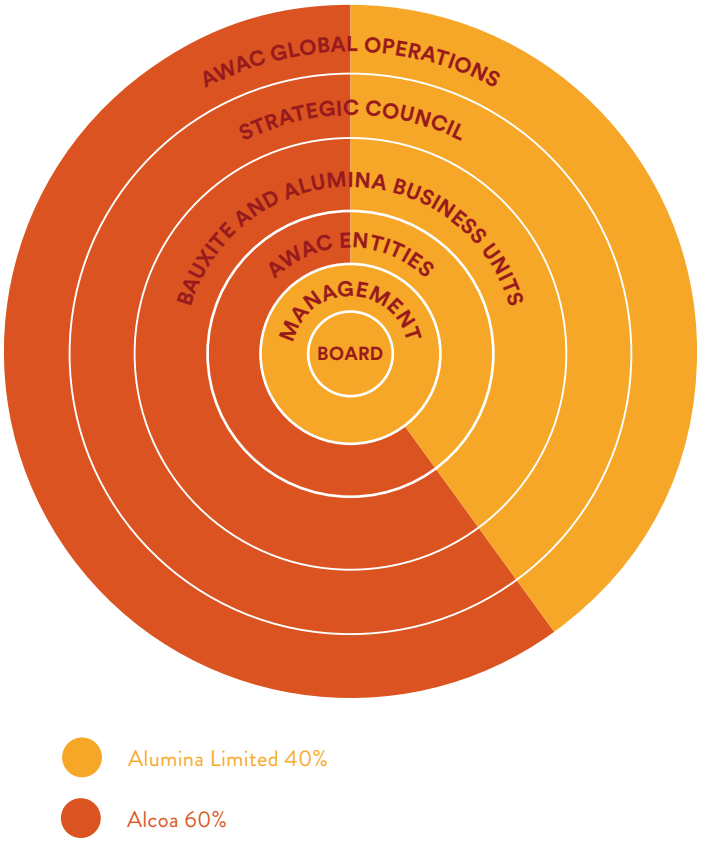
First produced in 1888, aluminium has become the second most-used metal in the world after iron. Nearly three-quarters of all aluminium ever made remains in use today, representing a growing 'energy and resource bank' requiring only five per cent of the original energy to produce the metal, and the metal can be recycled and reused endlessly. While AWAC is not involved in recycling of aluminium, product from AWAC's business can be easily recycled. Examples of areas where aluminium helps people and the economy to operate effectively and efficiently include air, road, rail and sea transport; food and medicine; packaging; construction; electronics and electricity transmission.

OUR INFLUENCE OVER AWAC

As a non-operating joint venture partner, Alumina Limited has limited influence over the day-to-day, technical and practical management of the AWAC joint venture. Operational and sustainability strategy is developed and implemented by Alcoa based on their operational, industry and technical knowledge of the operations together with their interaction and knowledge of stakeholder needs.

Alumina Limited's influence is largely of a governance nature. Alumina Limited participates in various forums that provide the opportunity to engage in governance matters impacting AWAC such as:

- Strategic Council, the governing body of AWAC. The Strategic Council consisting of 2 members (proportional representation) from Alumina Limited and 3 from Alcoa, is the principal forum that considers AWAC business and sustainability strategy and policy matters. Decisions made by the Strategic Council flow down to operations and are implemented. Alumina Limited has the opportunity to request information on any aspect of AWAC's operations for review and provide input into decisions that will impact the business. The Strategic Council meets at least biannually. In 2018, Alumina Limited's representatives were the Chief Executive Officer (CEO) Mr Mike Ferraro and Chief Financial Officer (CFO) Mr Chris Thiris (until his retirement), replaced by Ms Galina Kraeva (Interim CFO).
- Enterprise company representation. The assets of AWAC are held under a number of enterprise companies and Alumina Limited has right to proportional representation on each of those companies via the CEO and CFO. The Boards receive information on the operation of the relevant assets and Alumina Limited representatives are able to analyse on operational and other matters and contribute input.
- Business Unit (BU) representation. The major Business Units of AWAC are the Bauxite (mining) BU and the Alumina (refining) BU. The BU meetings focus on immediate operational issues and are attended by Alumina Limited senior executives and meet on a quarterly basis.
- Site visits. Alumina Limited Senior executives and appropriate staff, attend site visits each year which affords them the opportunity to review operations at close hand and enquire on any operational aspects. Visits include presentations by and discussions with site management, operational tours, discussions with industry experts and potential to meet representative of local communities.



OUR OPERATING CONTEXT AND STRATEGY

Alumina Limited's business interest in AWAC is heavily influenced by global economic growth and trends and the fundamentals of the alumina and aluminium markets. The influence of economic, market and competitor forces require Alumina Limited to actively monitor and analyse data and information to assist strategic analysis. A comprehensive appreciation of the key impacts enables Alumina Limited to provide guidance and measured judgement on the direction of AWAC decision making. Consequently, Alumina Limited invests in obtaining reliable and expert information to support decision making.

Supply and demand for alumina and aluminium has a direct impact on the product price and therefore the financial performance of AWAC and its returns to Alumina Limited. This was evident in 2018 when alumina market supply disruptions occurred due to a 50 per cent forced curtailment following environmental concerns at Alunorte, the world's largest alumina refinery and sanctions imposed by the US against Rusal. Those disruptions and supply side and environmental reforms in Chinese alumina and aluminium market contributed to the price of alumina increasing on average 36 per cent higher than 2017.

Economic growth and competitor strategy also impact AWAC. Curtailments or increases in aluminium production has a direct impact on Western World aluminium smelting that reduces demand for alumina.

Environmental and other social factors also impact the strategy and outlook for AWAC and Alumina Limited. AWAC's business is energy intensive and a significant emitter of GHG. Global Climate Change initiatives like the Paris Agreement to limit temperature increase also present a challenge to AWAC's business and forward planning and consideration of the mix of energy and what other measures could be considered. Alumina Limited is working with Alcoa to assess scenario analysis to test the resilience of the business and inform strategic thinking. Physical risk arising from climate change highlight issues such as water scarcity in South-west Australia where AWAC's major mining and refineries are present. They require thinking and action to conserve water consumption, not only for the businessbut also water supply community users.

Alumina Limited has a keen interest in the sustainability of its business interest in AWAC. We believe the business has a responsibility to communities in which it operates and supports responsible operating practices that protect the health and safety of employees and the community. By making a strong commitment to sustainability we believe that the workplace is improved, efficiency and productivity breakthroughs evolve, the environment benefits and is protected and the business positively contributes to the welfare of society. This focus on sustainability results in a competitive edge for the business, is recognised by investors, aids local community and government interaction, engages positively with the workforce and ultimately is positive to the bottom line.

> **"Solar energy is also being examined as a means to power the calcination process at AWAC's refineries and to solar reform natural gas using solar energy to increase a gas streams energy.**

Our stakeholders

For the purposes of this report Alumina Limited has identified the primary stakeholders as the investment community and government. They either hold a direct interest in the Company or influence over the operation of AWAC business that is Alumina Limited's principal interest.

PRIMARY STAKEHOLDERS

Investment community

- Institutional investors;
- Retail shareholders;
- Fund managers and analysts;
- Ratings agencies; and
- Financial markets.

Government and regulators

- Various governments in whose jurisdiction AWAC operates.

Employees

Alumina Limited with AWAC information however, some information gaps appear due to the difficulty in separating out AWAC specific information.

SECONDARY STAKEHOLDERS

- Local communities living near the AWAC operations;
- Interest groups and not-for-profit organisations may also be interested in this update; and
- Industry associations.

ENGAGEMENT WITH STAKEHOLDERS

Alumina Limited engages with stakeholders through:

- Investment roadshows in Australia and overseas;
- Meetings with institutional investors;
- Results presentations and our Annual General Meeting (available on our website);
- Program of shareholder communication, including opportunities for feedback; and
- Communicating, responding via ESG agencies their assessments.

Through these engagement opportunities, we will seek feedback on the usefulness of this sustainability update and tailor future reporting accordingly.

Alumina Limited representatives meet regularly with major shareholders and market analysts. Alumina Limited has a two-way communication strategy with its shareholders.

AWAC can be considered an investor in bauxite and alumina market via AWAC. Alumina Limited's only investment is its 40 percent interest in AWAC. Alumina Limited's stakeholders are those groups that have a direct relationship with the Company. Stakeholders in the AWAC business are identified by Alcoa, the manager/operator of AWAC.

Reclaimer at Juruti Brazil.

AWAC STAKEHOLDER ENGAGEMENT

In relation to AWAC, Alcoa identified as stakeholders, suppliers, employees; lenders; the people who live in the communities where AWAC operate; the public agencies that regulate the businesses; and the non-governmental organisation (NGOs) that are interested in AWAC's activities. Formalised channels of engagement exist for contracted parties e.g. customers, suppliers, employees, lenders and shareholders. Community Groups and NGOs require a more informal engagement and requires a structured approach, Alcoa have developed a Community Framework that has been adopted at all AWAC locations.

Alignment of stakeholder groups to our material themes of:

STAKEHOLDERS	MATERIAL THEMES			
	GOVERNANCE	COMMUNITY	ENVIRONMENT	PEOPLE
	Investment Community Government & Regulators	Government & Regulators Local community	Investment Community Government & Regulators Local community	Government & Regulators Local community

Material themes are addressed on pages 18 to 19.

Our material issues

To guide and focus sustainability reporting a materiality assessment of AWAC/Alumina was conducted in late 2018 to determine the most important sustainability risks and opportunities, consolidate risks, identify gaps and validate material topics.

Senior Management participated in a workshop in December 2018 identifying sustainability topics that reflect the most significant environmental, social and economic impacts that are the most important to stakeholders.

The outputs of the materiality assessment process will inform the direction of Alumina's commitments and approach towards sustainability, the development of the 2018 Sustainability Report and engagement with Alcoa.

MATERIALITY ASSESMENT

The approach to undertaking the materiality assessment included:

- Desktop analysis of internal and external sources;
- Interviews with internal and external stakeholders;
- Consolidation of inputs and the development of topic definitions;
- Prioritisation based on the frequency of recording the topic across sources;
- Weightings applied relative to the importance of the input; and
- Validation with executive in a workshop.

MATERIALITY ASSESSMENT OUTCOME

The outcomes of the materiality assessment produced four sustainability themes (Governance, Community, Environment and People) and seven material topics plus eight other topics of relevance (refer diagram on page 19).

GOVERNANCE

- **Business integrity**
- Supply chain and human rights
- Government and Industry relations

COMMUNITY

- Community engagement and investment
- Economic contribution

ENVIRONMENT

- **Energy emissions**
- **Climate change**
- **Waste**
- Land management and closure
- Water
- Process emissions
- Biodiversity

PEOPLE

- **Safety and health**
- Employee engagement and agreements
- Diversity and inclusions

* Note: the most material topics are highlighted in **bold.**

LINKAGE TO SUSTAINABLE DEVELOPMENT GOALS (SDGS)

SDGs are a collection of 17 global goals set by the UN in 2015, which aim to address some of the world's most pressing economic, environmental and social issues. Alcoa have aligned themselves to all 17 goals.

We undertook an SDG mapping exercise to determine the alignment of Alumina's material topics to the SDGs.

The mapping exercise was conducted considering the:

1. SDG linkage – alignment of Alumina's material topic definitions to relevant SDGs based on the associated SDG targets and indicators.
2. SDG impact – a high level qualitative analysis of the potential positive and negative impact of AWAC's operations on the achievement of the relevant SDGs.

The topics with the most direct linkage are identified above.

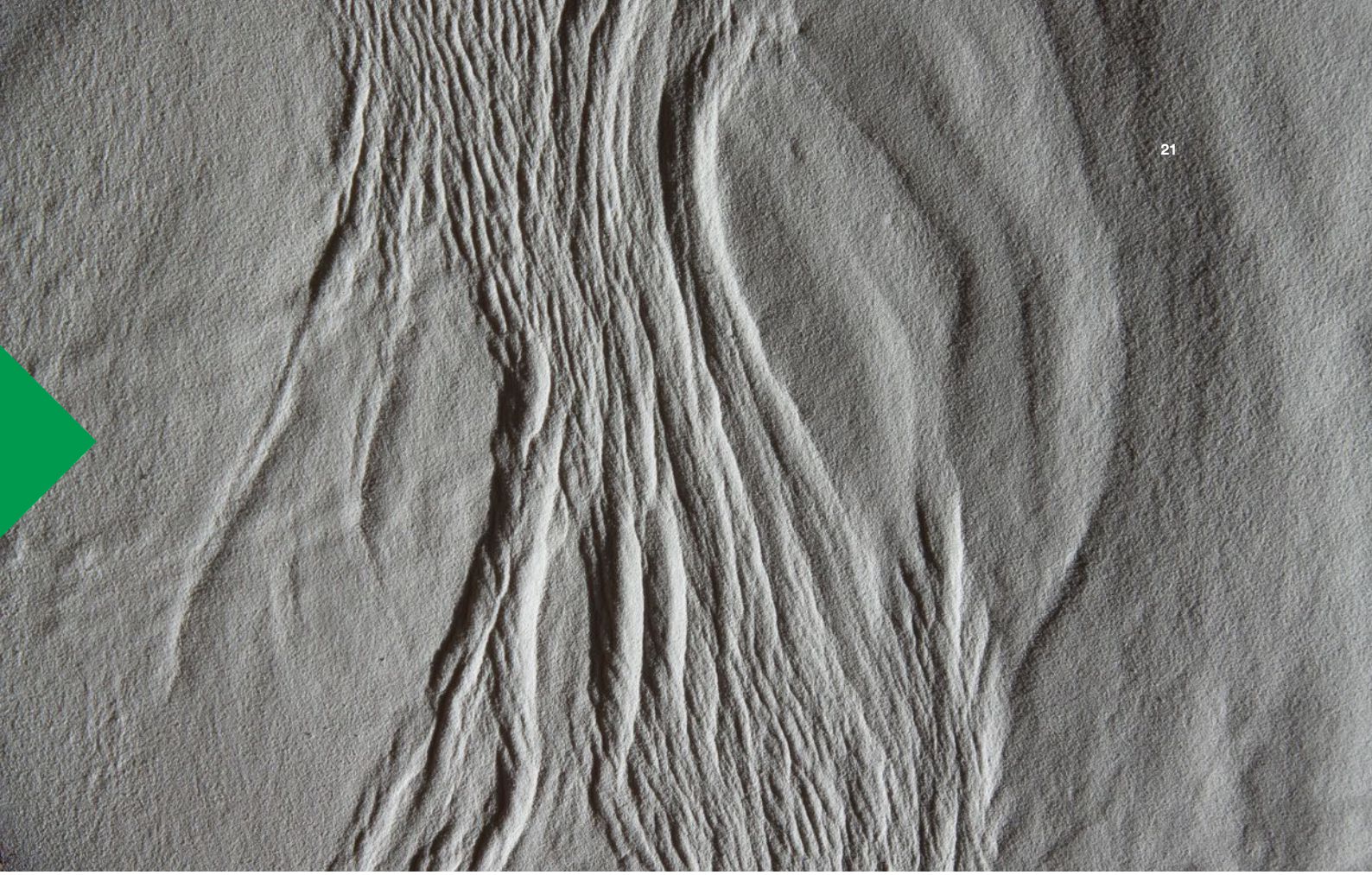
Our performance snapshot

In 2018, AWAC's operational and sustainability performance was consistent with the outcomes in 2017. The increase in Greenhouse Gas produced correlates with a nearly 50 per cent increase in production at the Portland aluminium smelter following resumption of lost production caused by a power outage in late 2016 that impacted the 2017 result.

2018 PERFORMANCE SNAPSHOT

Metric	2017	**2018**	Change
Bauxite mined (million tonnes)	42.4	**43.2**	1.6%
Alumina produced (million tonnes)	12.5	**12.2**	-2.4%
Aluminium produced (000 tonnes)[1]	112	**164**	47%
GHG (CO2e million tonnes)[1]	8.7	**9.3**	6.7%
GHG intensity (per tonne of production)	17.06	**17.22**	0.9%
Energy intensity (GJ per tonne of production)	74.07	**71.44**	-3.6%
Freshwater intensity (per tonne of production)	4.23	**3.84**	-9.4%
Lost Work Days	0.315	**0.203**	-36%
Days away	0.575	**0.567**	-1%
Total Recordable Injury Rate	1.299	**1.261**	-2.93

[1] Lower aluminium production in 2017 resulted from potline closure due to a power outage in late 2016. In 2018, the potline was again operating and lost production restored. The potline restart also resulted in higher GHG emissions due to increased usage of electricity. All values stated above are based on AWAC equity interests, not on a full facility basis.



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Filtration technology is used to minimise the volume of residue waste produced and reduce freshwater usage at AWAC’s Kwinana refinery.

Governance

Governance is the key aspect of Alumina Limited's corporate responsibility. It is through the governance function that the Company can add value to the AWAC business by reviewing material topics and adding a different perspective to the assessment of risk and opportunities that exist.

We can overlay another level of governance over Alcoa's governance structure for the AWAC business and Alumina Limited stakeholders. Take independent advice and apply it to material topics to support the sustainability efforts of our joint venture partner and review and analyse performance of sustainability strategies, processes and practices outworked by Alcoa.

In 2018 the composition of the Board and its Committees were:

Director	Board	Audit & Risk Management	Nomination	Compensation
Mr John Pizzey (Part year – retired 31 March 2018)	Chair Independent, Non-Executive Director	Member	Member	Member
Ms Emma Stein	Member Independent, Non-Executive Director	Member	Member	Chair
Mr Chen Zeng	Member Non-Executive Director	Member	Member	Member
Mr Peter Day (appointed Chair on 1 April 2018)	Member Independent, Non-Executive Director	Member	Member	Member
Mr Michael Ferraro	Member	n/a	n/a	n/a
Ms Deb O'Toole	Member Independent, Non-Executive Director	Chair	Member	Member
Mr John Bevan	Member Independent, Non-Executive Director	Member	Chair	Member

GOVERNANCE STRUCTURE

The Board is responsible for overseeing sustainability matters including reviewing risks, performance measurement, policies and disclosure. It is the responsibility of the senior executive team led by the Chief Executive Officer Mr Mike Ferraro, to ensure that the appropriate sustainability information is obtained from our joint venture partner and presented to the Board.

The Board is assisted in its oversight capacity by three Board Committees that are comprised of Non-Executive Directors.

A full description of Alumina Limited's governance principles and practices including details about Alumina Limited's three Board Committees, policies, director independence and remuneration is available in the governance section and Alumina Limited's 2018 Governance Statement on our website.

Governance Guidelines

Values and code of conduct

Board and committee Charters

Governance Oversight

Board of Directors

AUDIT & RISK MANAGEMENT COMMITTEE

Responsibilities

- Financial management & reporting
- Internal controls
- Risk management framework
- Audit strategy & performance

NOMINATION COMMITTEE

Responsibilities

- Select and appoint directors and CEO
- Identify necessary Board & committee competencies
- Assess Director skills & competency

COMPENSATION COMMITTEE

Responsibilities

- Oversight of remuneration, compensation plans, policies & practice

Delegation and Controls

Delegated authorities

Corporate Governance and internal controls

APPROACH TO GOVERNANCE

When Alumina Limited considers its corporate governance responsibilities it takes into account:

- analysing and adopting best practice governance principles and practices;
- overlaying its business philosophy and practices with its ethical values and principles;
- prudent delegation of responsibilities; and
- appropriate monitoring systems, processes and authorities, responsible delegation of duties and authorities and internal controls.

Risk

Central to the Board's role is risk management and mitigation. Alumina Limited's Risk Management Framework describes the risks identified by Alumina Limited as potentially significant for the current operations and profitability and/or the long-term value of the Company. The Risk Management Framework makes explicit the strategies and actions in place by the Company to manage each identified risk. Included are risks identified associated with the AWAC enterprise.

In terms of the AWAC joint venture, Alcoa Corporation is the manager/operator and has a key risk management role over the operations and administrative and marketing functions. Alumina Limited reviews the management and mitigation of AWAC risks through participation on the AWAC Strategic Council and Boards of the key operating entities.

Ultimately, Alumina Limited's directors oversee risk identification and management through the Audit & Risk Management Committee. It is also the direct responsibility of the Audit & Risk Management Committee to review business risk assessments to ensure appropriate coverage in the internal audit plans.

SUSTAINABILITY GOVERNANCE

In terms of sustainability governance for AWAC, Alumina Limited's principal interest is the integration of sound environmental, social and governance practices alongside sustainable financial performance.

We do this through:

- Materiality and risk assessment;
- discussing AWAC's long term strategies and objectives with managing partner Alcoa;
- supporting the policies and practices that are implemented in AWAC companies to ensure responsible and sustainable operations;
- reviewing performance; and
- reviewing reports of non-compliances including for environmental and labour matters.

Alumina Limited assesses potential sustainability risks and opportunities for shareholders. We do this through our Risk Management Framework's processes that are reviewed and updated through the Audit and Risk Management Committee.

BUSINESS INTEGRITY

Why this matters to us

Setting a culture of integrity and honesty is the foundation of responsible business practices. It means being honest with yourself and confident in the decisions you make. It also provides confidence in third party dealings.

Alumina Limited's Corporate Governance Framework is underpinned by its corporate values and Code of Conduct. These are the defining ethical boundaries of the Company which contribute to the Company's corporate culture. These principles apply to the Company's directors, Chief Executive Officer (CEO), senior executives and other employees.

Alumina Limited also has a Sustainability Policy that outlines our commitment and goals towards sustainable business practices in relation to the Company, AWAC and our stakeholders.

How this is managed

Training on Alumina Limited's Code of Conduct and associated governance policies (refer below), is conducted annually and directors, the CEO, senior executives and other employees are required to certify that they understand and agree to abide by these standards.

Other governance policies that drive ethical and responsible business practice:

- Anti-corruption and Money Laundering Policy;
- Human Rights Policy;
- International Business Conduct Policy;
- Environment, Health and Safety Policy;
- Diversity Policy;
- Equal Opportunity and Non-discrimination Policy.

As a non-operating joint venture partner, Alumina Limited has limited influence over the day-to-day, technical and practical management of the AWAC joint venture. Operational and sustainability strategy is developed and implemented by Alcoa based on their operational, industry and technical knowledge of the operations together with their interaction and knowledge of stakeholder needs.

Alumina Limited's influence is largely of a strategic and governance nature. Alumina Limited participates in various forums that provide the opportunity to engage in governance matters impacting AWAC such as:

- Strategic Council, the governing body of AWAC;
- Enterprise company representation;
- Business Unit (BU) representation; and
- Site visits.

SUPPLY CHAIN AND HUMAN RIGHTS

Why this matters to us

To ensure that responsible and ethical business practices occur at the AWAC operational level, Alumina Limited relies on Alcoa as manager/operator to provide assurance that appropriate practices and compliance to Alcoa standards occur. That assurance is provided via Ethics and Compliance Updates provided at Strategic Council meetings where any incidence of non-compliance is discussed.

AWAC's supply chain and procurement management is the responsibility of Alcoa as AWAC's manager/operator. Alumina Limited is confident that the processes used by Alcoa are robust and designed to require responsible and sustainable behaviour based on the highest standards of integrity and compliance with all relevant laws and regulations.

How this is managed

Where AWAC participates in joint venture projects that are not operated/managed by Alcoa and or relies on supply chain partners, Alcoa reviews and monitors the compliance programs of those significant joint ventures to ensure those operations act responsibly and exercise ethical business practices in compliance with AWAC/Alcoa guidelines. Under this program, a steering committee composed of senior Alcoa executives provides oversight to local teams charged with reviewing and monitoring the ethics and compliance practices of the joint venture.

These reviews are conducted in collaboration with the joint venture partner and focus on key compliance program components, including:

- Commitment from senior management;
- Oversight, autonomy and resources for compliance;
- Code of conduct, anti-corruption and other compliance policies and procedures; and
- Ethics training, confidential reporting and investigations.

Global Supplier Sustainability Program

Alcoa use their Global Supplier Sustainability Program to assess and help improve sustainability of AWAC's key suppliers that present the biggest sustainability risk to the business. These include companies that contribute the most to AWAC's carbon footprint, possess preferred status, are sole sources of supply, are located in emerging or high-risk countries, or provide regulated commodities.

The program consists of four components:

- Communicate expectations: Clearly define our sustainability expectations and communicate them through discussions and Alcoa's Supplier Standards.
- Assess supplier: formally assess the performance of key suppliers to evaluate the maturity of their sustainability programs and determine where improvements are needed.
- Develop and educate: For suppliers that fall into the emerging and lagging categories, provide education and tools to develop and improve their programs. Also require action plans and demonstrated improvements in the development of their sustainability programs.
- Monitor: reassess suppliers in the emerging and lagging categories annually. Those that do not demonstrate annual improvements face the risk of losing AWAC's business.

Alcoa work with supply chain partners to ensure alignment around the compliance programs for the joint venture and develop plans to close any identified gaps. As part of the process, Alcoa share their best practices. In 2018, Alcoa developed an enhanced supplier sustainability program utilising a third-party supplier due-diligence program to further manage supply chain risk in relation to anti-bribery and corruption, trade compliance, child and slave labour, criminal history, human trafficking and conflict minerals. The program targets suppliers with a spend over US$50,000 per year that are located in high-risk countries or over US$1,000,000 per year in non-high-risk countries.

GOVERNMENT AND INDUSTRY RELATIONS

AWAC operations are subject to various government and regulatory decisions and policies that can impact or potentially impact operations. AWAC advocates through Alcoa's and Alumina Limited's participation in industry associations and also direct contact.

Topical issues include GHG policies and regulations and the industry's approach on carbon regulation. In 2018 AWAC, via its manager/operator Alcoa, engaged with the Australian Government on the impacts of climate policy and regulations.

POLITICAL DONATIONS AND MEMBERSHIPS

In line with our Code of Conduct and Anti-Corruption Policy, Alumina Limited does not donate to any political party or aligned interest group. In 2018, no political donations were made.

During 2018, Alumina Limited was a member of the following organisations:

- Australian Aluminium Council;
- International Aluminium Institute;
- Business Council of Australia;

and via AWAC/Alcoa;

- Aluminium Stewardship Initiative.

Community

Partnering with local communities and broader society is vitally important to the continuing operation and sustainability of AWAC. AWAC's facilities operate in diverse communities and directly impact their social, economic and environmental wellbeing.

COMMUNITY ENGAGEMENT AND INVESTMENT

Why this matters to us

We recognise that AWAC has a significant role and responsibility in the communities in which it operates. This influence extends to creating employment for local people, utilising supplies sourced locally or from other distributed suppliers. Local and other government economies are supported through wealth generation and payment of various taxes.

Consultation with community partners is important for AWAC to understand how the business influences the community and to gain a better understanding of the concerns, needs and priorities of the community. Communities are generally interested in:

- Economic contribution including employment opportunities;
- Land use;
- Environmental impact - climate change, water availability;
- Community health and safety matters; and
- Support for local initiatives in community development and education.

How is this managed

Community engagement requires a community approach. AWAC operations follow a framework developed by Alcoa to guide stakeholder engagement. The framework provides a systematic process to first identify appropriate stakeholders and then engage with them in the most effective manner. Many of the AWAC locations have community advisory boards that include representatives from stakeholder groups. Engagement is also made with stakeholders, primarily local communities and non-governmental organisations through the Alcoa Foundation. The method of engagement varies by location. Some do so through their community advisory board, while others consult with employees or local leaders and institutions.

With responsibility comes risks. From time to time issues arise at locations where AWAC has operations that require collaboration with the community to obtain a mutually acceptable result. In 2018 the following issues were dealt with at the community level.

ISSUE RESOLUTION EXAMPLES

Location	Issue	Action
Anglesea, Australia	Following the permanent closure of AWAC's Anglesea operations in 2015, there has been significant interest in the future of the site, including the decommissioning, remediation and land planning processes currently underway. Key issues raised by some community members include the future location of the Anglesea Bike Park (currently on Alcoa freehold land); the possible retention of the industrial stack for future repurposing; the proposed residential and accommodation precinct; and concerns about the method to demolish the power station.	Community engagement continues to be a key component of the Anglesea project. The strategic engagement program aims to keep the local community and key stakeholders informed of, and engaged in, AWAC activities to ensure feedback from the community is considered in decision making. During 2018, AWAC, represented by Alcoa as manager, held 11 public meetings (six community consultation network meetings and five community drop-in sessions) with a total attendance of more than 600 people. Alcoa also published 20 newspaper advertorials, sent three letters to 1,200 residents and businesses, conducted one-on-one briefings, received public submissions and facilitated a dedicated online engagement platform. AWAC provided the Alcoa Freehold Concept Master Plan Anglesea to the Department of Environment, Land, Water and Planning in March 2018. The plan incorporated stakeholder feedback on the draft concept master plan, which was released in January 2018 for consultation (see the Phase 4 Community Engagement Report). The community engagement program will continue in 2019.
Kwinana, Australia	Since the Western Australian Planning Commission (WAPC) adopted the Kwinana air-quality buffer in September 2010, there has been litigation and questions relative to the legitimacy of the buffer and land uses in the area. In 2018, the matter was referred to the WAPC as part of an improvement plan process. The WAPC provided advice to the Minister for Planning.	AWAC supports compatible development in the Mandogalup area. However, we maintain that there needs to be adequate separation between industry and residential development. During 2018, AWAC engaged with the Department of Planning, City of Kwinana, the WAPC and the Minister for Planning's advisors and other interested stakeholders, including local landholders. In April 2019, the Minister for Planning approved an improvement plan for the Mandogalup area that will be released for public consultation.
Western Australian bauxite operations	As part of AWAC's ongoing work to establish the potential viability of mining around Dwellingup, the phase-two feasibility study continued. This includes community consultation and an environmental impact assessment.	AWAC collaborated with local government to form a stakeholder consultation group called Dwellingup Futures that comprises local and state government, industry and community group representation. The first meeting was held in November 2018. The group's objective is to create a vision and plan for the future of Dwellingup, where different sectors, industries and land users can coexist for the long-term benefit of the town, region and state. AWAC continues to communicate one-on-one with interested community members.

Location	Issue	Action
Western Australian Bauxite and Alumina Operations	In response to the expiration of the 2014 Australian Workers' Union (AWU) Australian Enterprise Bargaining Agreement (EBA), AWAC sought to negotiate a new, modern agreement to enable more efficient and productive operation of AWAC's Western Australian mines and refineries and to improve its ability to respond to market conditions. In March 2018, following more than 12 months of unsuccessful negotiations and industrial action early in the year, AWAC applied to the Fair Work Commission (FWC) for a mediated negotiation process and to have the 2014 EBA terminated. AWU members initiated an extended period of industrial action in August. The termination application was heard by the FWC in September. In December, the FWC ruled to terminate the expired EBA. The AWU subsequently announced its intention to appeal the decision.	AWAC's direct engagement with AWU members included good faith negotiations and mediated conciliation meetings, briefings and written communications. Twice a new proposed EBAs was put to an employee vote, neither of which were approved. There was extensive communication throughout the year to inform employees of the status of the issue. AWAC also engaged stakeholders, including local, state and federal government representatives, suppliers, community partners and the media. Indirect communication included media statements, newspaper advertorials and the publication of an opinion article in the Australian Financial Review by Alcoa of Australia's chairman and managing director. In February 2019, AWAC asked AWU members to vote on a new proposed EBA. This proposal was voted down. AWAC continue to work to reach a new agreement. In April 2019, the Full Bench of the FWC upheld the AWU's appeal and sent the matter back for redetermination by the same FWC deputy president who had heard the original application to terminate.
Juruti, Brazil	The Juruti City Council continued requesting information on the operations of AWAC's Juruti mine, with some council members taking a negative position on the mine in council meetings and social media.	AWAC continued sending clarifying information when requested and reiterated our offer for council members to tour the site and have a meeting with mine leadership to receive detailed information regarding our operations. None accepted the invitation.
Juruti, Brazil	A federal deputy voiced concern about the regulated practice of local police removing people who were living illegally on Alcoa-owned land in the Juruti region.	The regional court in Santarém mandated the removal of the squatters. We engaged with the deputy and the municipal government, agreeing to donate land to the municipality for a government housing program for those living illegally on AWAC/Alcoa-owned land.
Juruti, Brazil	Following a visit and public hearing, the federal Public Ministry recommended that AWAC/ Alcoa cease mining operations in the Lago Grande region in Santarém. The Federal Court of Santarém ruled in favour of the recommendation and prohibited AWAC from carrying out any activity in the region.	Alcoa clarified to the ministry and court that we have not conducted any mining activity in the area since 2008. Community relations activities were immediately suspended in the area upon learning of the Public Ministry's recommendation. AWAC engaged the National Institute of Colonization and Agrarian Reform (Incra) to serve as an intermediary with the community to ensure understanding of our position.

Location	Issue	Action
Juruti, Brazil	The Association of Communities of the Juruti Velho Region (ACORJUVE) was unable to secure environmental approval for the removal and use of valuable wood from our mining operations that was stored on association land. Some of this wood has been deteriorating due to its exposure to the elements. Wood is an important source of revenue for the communities, and failure to obtain this permit is negatively affecting the local economy.	AWAC have participated in meetings with the environmental agency and ACORJUVE. We also have kept the community informed as to the volume and value of the wood, which is owned by the association.
São Luis, Brazil	Residents of neighbouring communities expressed concern about our Alumar location hiring professionals who do not live in the area to construct a bauxite residue storage area.	A meeting with leaders from the 11 communities surrounding the Alumar operations was held to discuss the project's schedule and contracting. Alcoa also conducted 11 community meetings, which had an average attendance of 400 people, to discuss the participation and prioritization of residents in the project. Alcoa created an online community to post job opportunities and collect resumes. Approximately half of the project's labour requirements were filled by area residents. The remaining positions were filled by people who had skills or knowledge that was not available in the local workforce.

Local communities benefit from AWAC's presence through direct financial and practical support for worthy community projects like education and training, environment and community enhancements.

Communities are also engaged and involved in transformation work at closed AWAC facilities. Community input was sought and received on the strategy and Master Plans for the transformation of the site of the former Pt. Henry aluminium smelter and the Anglesea Power Station and coal mine in Victoria, Australia.

From December 2015 to January 2017, AWAC engaged with the community and key stakeholders to seek feedback which would inform the development of the Point Henry 575 Concept Master Plan.

During this period, AWAC actively engaged with and informed the community through open houses, workshops, listening posts, briefings, advertising, media coverage and an online engagement platform.

The first two phases of community engagement focused on developing the Shared Vision for Point Henry 575. The Shared Vision themes, and their respective guiding principles, articulate the aspirations and outcomes the community is seeking in the delivery of Point Henry 575:

- Support and build on the prosperity of the Geelong region;
- Embrace and celebrate the coastal landscape;
- Create a diverse and inclusive place;
- Honour the various histories of the site; and
- Complement the Geelong region.

The third phase of community engagement followed the release of the draft Concept Master Plan and provided opportunities for the community and key stakeholders to learn about and consider the draft plan, and provide feedback to AWAC ahead of its finalisation.

Across the three phases of community engagement since 2015, there were approximately 2,400 community contacts across 16 community events, contributing more than 300 comments, ideas and submissions.

Indigenous peoples - Local partnerships

Currently AWAC operates in areas home to indigenous peoples including:

- Australia
- Suriname
- Juruti and Brazil.

Many of AWAC's Australian operations engage with local communities to develop an environmental improvement plan, which is a public commitment to continuously improve environmental performance, reduce environmental impacts, and develop more sustainable practices.

Performance

During 2018 there were no reported human rights non-compliances through AWAC or Alumina Limited.

ECONOMIC CONTRIBUTION

Why this matters to us

The sustainable economic performance of AWAC is vital to our future success and this is predicated on its ongoing ability to secure access to land, natural resources, employees, community support, financial capital and future market demand.

AWAC'S EBITDA increased by approximately one billion dollars to two point six billion dollars. Higher alumina prices increased revenue by approximately 1.4 billion dollars.

Performance

Alumina Limited Dividends

Generally, the Board intends, on an annual basis, to distribute cash from operations after debt servicing and corporate costs commitments have been met. The Board will also consider the capital structure of Alumina Limited, the capital requirements for the AWAC business and market conditions. Dividends paid will be fully franked for the foreseeable future.

Payment Date	Type	Payment Amount	Australian Cents	Franking Tax Rate %	Franked Amount	Drp Price Per Share A$
14 Mar 2019	2018 Final	US$0.141	19.5997	30	Full	DRP Suspended
20 Sep 2018	2018 interim	US$0.086	11.7094	30	Full	DRP Suspended
15 Mar 18	2017 Final	US$0.093	11.93	30	Full	DRP Suspended
14 Sep 17	2017 Interim	US$0.042	5.2774	30	Full	DRP Suspended
22 Mar 17	2016 Final	US$0.031	4.0362	30	Full	DRP Suspended
15 Sep 16	2016 Interim	US$0.029	3.8543	30	Full	DRP Suspended
23 Mar 16	2015 Final	US$0.018	2.4705	30	Full	DRP Suspended
28 Sep 15	2015 Interim	US$0.045	6.4185	30	Full	$1.22
25 Mar 15	2014 Final	US$0.016	2.047	30	Full	DRP Suspended
21 Aug 14	2014 Interim	Nil	Nil	n/a	n/a	DRP Suspended
20 Feb 14	2013 Final	Nil	Nil	n/a	n/a	DRP Suspended
22 Aug 13	2013 Interim	Nil	Nil	n/a	n/a	DRP Suspended

Broader Economic Contribution

Alumina Limited directly contributes economic value through dividends to shareholders as well as payments to employees, suppliers and service providers.

In 2018 Alumina Limited distributed total declared dividend for the year of US22.7 cents per share ($653.8 million). This is a substantial increase on the US13.5 cents per share ($388.7 million) for 2017. During 2018, Alumina Limited general and administrative expenses were $11.6 million compared to $13.6 million in 2017.

DISTRIBUTION OF ALUMINA LIMITED ECONOMIC CONTRIBUTION 2018*

- Dividends paid $515.5 million
- Payments for investments in associates $108.8 million
- Net financing costs $7.5 million
- Employee benefits $6.2 million
- Payments to suppliers $4.5 million

DISTRIBUTION OF ALUMINA LIMITED ECONOMIC CONTRIBUTION 2017*

- Dividends paid $210.2 million
- Payments for investments in associates $80 million
- Net financing costs $8.6 million
- Employee benefits $6.9 million
- Payments to suppliers $5.2 million

*These values relate only to Alumina Limited and do not reflect AWAC results.

In 2018 AWAC employed 5,171 people, contributing directly to the economy of the many communities and seven countries in which it operates. In the normal course of its operations, AWAC also supports regional economic growth through paying taxes and royalties. Local communities benefit from grants and financial assistance offered in community projects and infrastructure development. In Australia, AWAC's operations spend approximately $2.1 billion in annual expenditure, 80% of which is local content. Annual exports are approximately $4.4 billion. 65% of annual revenue remains in Australia in the form of taxes, wages, local purchasing, royalties and shareholder dividends. Wages and benefits to over 4,200 employees exceed $650 million.

Environment

Alumina Limited understands the fundamental link between long-term profitability and the sustainability of AWAC's operating performance. Decisions and actions we make today influence future economic, environmental and social outcomes, and determine long-term profitability and returns for our shareholders.

Alumina Limited believes that business sustainability is dependent on the integration into the business plan of responsible and meaningful sustainability objectives that, among other things, result in sensible management of the environment. Environmental management has long existed as a core activity at AWAC locations, particularly in the area of mine rehabilitation, outcomes of which have been recognised internationally. Alumina refining and smelting is resource and energy intensive, so minimising the life-cycle impact of alumina and aluminium production is essential.

Environmental material topics include:

Energy	The refining of bauxite ore into alumina and the subsequent smelting of aluminium require significant energy resources resulting in the significant stewardship issues of energy efficiency and emissions management.
Waste	In AWAC, a considerable amount of bauxite residue results and requires management. The residue, that is a result of the process of extracting alumina from bauxite ore, also contains some residual caustic soda.
Climate Change	Identified potential physical and transitional climate-change related risks to AWAC, pose challenges in the future management of the operations in regard to energy usage, GHG emissions, carbon pricing policies and regulations and market demand.
Land management and closure	AWAC mines in biodiverse areas such as the Jarrah forest in Western Australia and the Amazon rainforest in Brazil. These areas require specialised management. In recent years, some AWAC operations have been closed and the remediation of those sites is very important.
Water	Water management for the continuation of sustainable water supplies for AWAC's operations and the community is essential.
Process emissions	Management and mitigation of process emissions resulting from refining of alumina from bauxite ore and smelting aluminium from alumina.
Biodiversity	Management of impacts of activities, products and services on biodiversity, habitat protection and restoration and operational sites in or adjacent to areas of high biodiversity value.

The aim is responsible resource management that minimises the impact on the immediate natural environment and communities in which AWAC operates, and products that are beneficial to the environment.

We believe that through demonstrating effective and responsible environmental stewardship, AWAC will be will continue to be granted a licence to operate.

How this is managed

Alumina Limited's role is to support Alcoa in managing AWAC to achieve best practice in environment, safety, community and financial performance through strong, collaborative and informed governance.

We do this through:

- reviewing 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; and
- reviewing reports of non-compliances on human rights, environmental, labour or anti-corruption grounds.

Alcoa is an experienced and internationally recognised environmental manager, with a sophisticated system for managing, monitoring and mitigating environmental impacts through new technology and evolving operational processes.

Performance

In 2018 AWAC were not fined for environmental non-compliance. However, a major spill was experienced at AWAC's Kwinana refinery in Western Australia, where approximately 150,000 litres of mud slurry was released following a blockage in a pipe. The spill was contained and a clean-up conducted to relevant environmental requirements. An environmental assessment confirmed there were no material environmental impacts. There were also numerous small spills exceeding 20 litres; however, none of the spills resulted in a significant financial impact and did not constitute a significant environmental non-compliance either from Alumina Limited's activities or AWAC's global operations i.e. potential to cause significant harm to the environment.

ENERGY

Energy is a vital input in the responsible, sustainable and economic production of both alumina and aluminium.

Why energy matters to us

Production of alumina and aluminium are energy intensive processes. Available, reliable, long-term and cost-effective energy is a necessity. The efficient management of energy consumption has a direct influence on the cost of production and viability of the business, with energy accounting for approximately 23% of the cash cost of production for alumina and 24% for aluminium. It also has a direct bearing on the level of CO2e emissions generated in the production processes and is a key factor, together with sourcing low-carbon fuel, to lowering energy intensity per tonne of production.

High carbon fuels like coal and oil contribute to higher CO2e emissions. AWAC's refineries, with the exception of Alumar in Brazil, operate on natural gas, an efficient transitional energy source. Alumar runs on a mix of coal and fuel oil.

AWAC's energy performance has improved since commencing a portfolio restructure in 2014 that resulted in the closure, sale or curtailment of high cost and lower energy efficient assets and concentrating on low cost production facilities. This transformation process included the challenge of replacing reliance on more expensive and inefficient fuel sources at existing operations such as the alumina refinery located at San Ciprian in Spain.

Risks

Rising energy costs are an area of concern. Dependency on fossil-based energies also creates commercial and policy risks for AWAC especially with increasing attention to carbon pricing and other pricing mechanisms. Long-term supply of affordable energy is also a priority.

Energy Security

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 AWAC's energy strategy, with the aim to minimise impacts and maximise value.

In Western Australia, AWAC's three alumina refineries - Kwinana, Pinjarra and Wagerup - are currently powered on gas sourced primarily from the North West Shelf and have two gas-fired cogeneration units. AWAC's refineries in Western Australia are the States' single largest user of natural gas, consuming approximately 40 per cent of the gas supplied to the south west of the state and about 25 per cent of the state's total domestic gas supply.

How this is managed

Energy security is based on the completion of long-term contracts. More than 90 per cent of the gas supply to the three refineries in Western Australia is secured under long-term contracts until 2020. In 2015, Alcoa of Australia secured a significant amount of its gas supplies to 2032. In 2018, AWAC also secured three new gas supply agreements which combined will supply approximately 25 per cent of the Company's gas requirement in Western Australia (WA) from 2020 for a number of years.

Energy efficiency improvements and reduction of energy consumption is a focus of operational improvements and technological advances. AWAC's refining operations have implemented process improvements involving improved process controls, heat transfer efficiency and maintenance improvements. Benchmarking and site-specific targets help drive energy efficiency initiatives.

In 2018, AWAC's Western Australian refineries were examining solar thermal energy to assist in powering the calcining process and solar gas reforming (using solar energy to increase a gas streams energy by up to 20 – 30%) in the refining process.

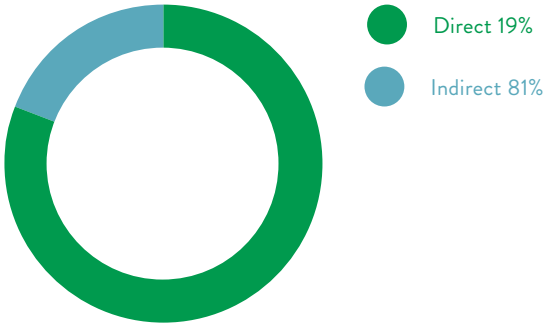
AWAC's Australian refineries and the Portland smelter utilise energy demand management which allows for reduction in its demand for electricity at peak demand for electricity (generally the hottest days of the year).

Facility	Main source of energy	Direct or indirect consumption
Pinjarra	Natural gas	Direct
Kwinana	Natural gas	Direct
Wagerup	Natural gas	Direct
San Ciprian	Natural gas	Direct
Pt Comfort (curtailed)	Natural gas	Direct
Alumar (39% AWAC)	Fuel oil/coal	Direct
Portland smelter (55% AWAC)	Purchased electricity (mainly coal generated)	Indirect

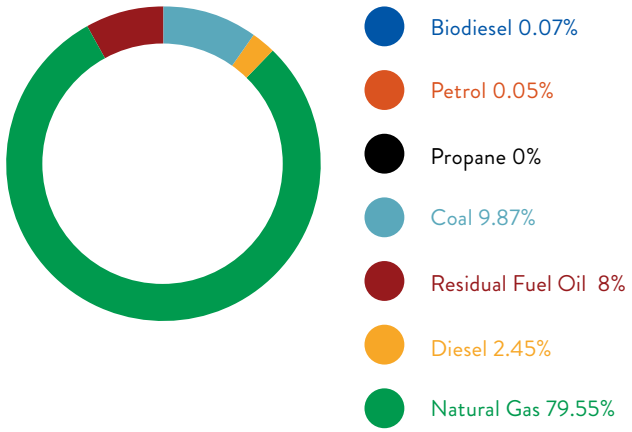
This provides support for the stability of electrical infrastructure and avoids additional costs of electricity generation on those extreme days.

Comparatively small amounts of petrol/gasoline and LPG are used, while biodiesel fuels power some mobile equipment and industrial vehicles on site.

AWAC 2018 Direct and Indirect energy consumption



AWAC 2018 Direct energy consumption by fuel source



Performance

AWAC's operations are highly dependent on the availability of base load energy. In 2018 energy consumption for all of AWAC's operations globally on a full facility basis was approximately 41 million MWh in line with the total energy consumption in 2017.

AWAC assets	2017 Energy efficiency measured by GJ of energy required per tonne of production	2018 Energy efficiency measured by GJ of energy required per tonne of production	% change
Mining (bauxite)	6.2	6.5	-4.84
Refining (alumina)	9.14	9.07	0.77
Smelting (aluminium)	56.75	53.9	5.0

AWAC Full Facility Direct Energy consumption by source (mines, refineries and smelter)

Awac direct energy source	Purchased or produced	2014GJ	2015GJ	2016GJ	2017GJ	**2018GJ**
Natural gas	Purchased	102,505,492	113,987,709[1]	98,858,338[4]	96,937,976	**92,694,748**
Diesel	Purchased	2,742,985	2,548,161	2,563,766	2,728,504	**2,852,216**
Petrol/gasoline	Purchased	86,909	65,862	52,422	54,094	**62,675**
Propane	Purchased	15,949	11,049	9,676	7,380	**5,766**
Coal	Purchased/ Produced	13,406,757	11,232,338	12,717,307	12,222,105	**11,499,896**
Residual fuel oil	Purchased	38,482,698	17,297,114[3]	9,908,159	9,808,686	**9,326,396**
Biodiesel	Purchased	25,924	29,802	30,058	58,444	**76,986**

[1] Natural gas consumption grew with the transition of the San Ciprian refinery from fuel oil to gas.
[2] Reliance on coal declined with the closure of the Pt. Henry aluminium smelter located in Victoria in August 2014 and the subsequent closure in 2015 of the Anglesea (coal fired) power station.
[3] Residual fuel oil dropped following the sale of the Jamalco refinery, transition of the San Ciprian refinery from oil to natural gas and some curtailment of production at the Suralco refinery.
[4] Natural gas usage reduced due to the curtailment of the Point Comfort refinery.

AWAC Indirect Energy consumption by source
(Mines, refineries and smelters)

	Full Facility 2014GJ	Full Facility 2015GJ	Full Facility 2016GJ	Full Facility 2017GJ	**Full Facility 2018GJ**
Electricity (Non-renewable)	24,459,261	18,374,903	16,580,489	12,151,429[2]	**16,665,325[2]**
Electricity (Renewable)	3,715,457	3,149,789	1,359,424	2,129,291	**2,191,507**
Total electricity	28,174,718	21,524,692	17,939,913	14,280,720	**18,856,832**
Steam	11,983,716	12,954,290	13,499,481	13,067,325	**13,913,323**

[1] Non-renewable electricity usage dropped in 2015 due to the closure of the Point Henry aluminium smelter.
[2] The increase in electricity usage between 2018 and 2017 is due largely to the increase in electricity used at the Portland smelter resulting from production increase following the restoration of a potline that was lost for most of 2017 due to the December 2016 power outage.

EMISSIONS

The processes required to refine alumina from bauxite ore and to smelt aluminium from alumina require significant amounts of energy. Significant emissions invariably result.

Why this matters to us

AWAC recognises the importance to contribute to minimising climate change impact by reducing energy consumption and GHG emissions. In an environment of increasing GHG regulation, restricting emissions can also contribute to minimising the cost to the business.

Our focus and, importantly, that of operating partner Alcoa, is on decreasing GHG intensity via:

- Increasing energy efficiency through process and technology improvements;
- Investigating alternative energy sources from low or no carbon-based generation, (renewable options to meet large volume energy requirements are limited in many regions); and
- Advancing technological solutions for GHG abatement.

How is this managed

A major challenge is balancing the need to ensure energy security with energy diversification. Opportunities to switch energy sources are restricted by:

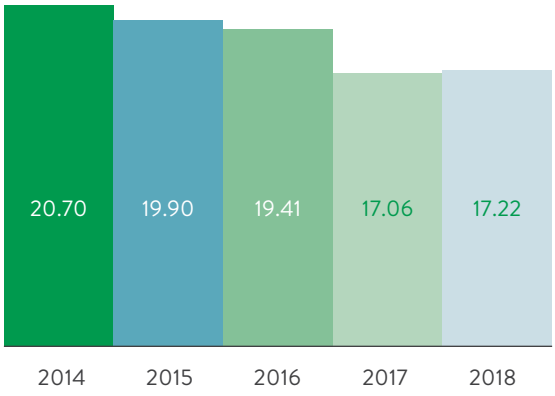
- Long-term energy contracts that exist at AWAC's Western Australia refineries;
- The need for base load electricity supply at the Portland smelter.

Despite these hurdles, Alcoa continue to pursue opportunities to reduce the carbon intensity of AWAC's purchased electricity.

Performance

In 2018 AWAC's total (on a full facility basis) absolute greenhouse gas emissions from AWAC's operations increased by approximately 10.46% to 12.5 million tonnes from 11.3 million tonnes of CO2 registered in 2017. The major contributor to the increase was a 47% increase in aluminium metal production at the Portland smelter following a restoration of lost production in 2017 resulting from a power outage. The increase in production caused GHG emissions from the smelter to increase by a similar percentage (46%).

Combined Smelter and Refinery GHG Intensity (Metric ton GHG per tonne of production)



Greenhouse Gas Emissions[1] – Full facility (tonnes of CO_2 equivalents)

GHG	2014	2015	2016	2017	**2018**
Direct (Scope 1)	10,330,772	8,986,055	7,788,387	7,575,617	**7,413,321**
Indirect (Scope 2)	8,123,143	6,180,774	5,588,770	3,741,416	**5,087,177**
Total (Scope 1 & 2)	18,453,915	15,166,829	13,377,157	11,317,033	**12,500,498**
(Scope 3)	-	-	-	34,468,831	**35,103,007**

[1] Emissions Calculation Methodology

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition), Australia - National Greenhouse and Energy Reporting Act, Brazil GHG Protocol Programme and The Climate Registry: General Reporting Protocol. Emission per source calculated by applying WRI Calculation Tool.

Scope 1 (direct GHG) emissions are those released directly by AWAC's sites through direct use of energy sources on-site such as natural gas. Scope 2 or indirect emissions are those from electricity generated by external energy suppliers that supply energy to AWAC's sites and also associated with the generation of steam at the co-generation facilities located at the Pinjarra refinery.

In 2018 Scope 3 emissions have also been calculated for the second time and included as contributor to the value of Scope 3 emissions is processing of sold goods. Sales of alumina is the main product of AWAC. Alumina is used downstream by customers in the production of aluminium, which is an energy intensive activity.

CLIMATE CHANGE IMPACTS

Why this matters to us

Climate change was identified as a material issue for our business and our stakeholders. Alumina is committed to providing meaningful and relevant disclosures of climate-related risks and opportunities for AWAC.

Climate change risk

Climate change risk is assessed in Alumina Limited's Risk Management Framework. Through our role on AWAC's Strategic Council and other relevant AWAC boards, we support Alcoa's efforts in managing risks such as described in the following table:

Risk Areas	Risk Descriptions	Actions
Physical: Increased physical events such as more extreme weather events and systemic climactic changes.	Increased risks to personnel, business continuity, production and facilities. Climate factors like extreme weather events are likely to have an impact on AWAC's global mining and refining operations. Water stress and potential impact on production if shortages occurred. Disruption to Supply chain efficiencies from storm activity, and the transportation of raw materials. Climatic changes leading to changes in rainfall and sea levels	To minimise the potential impact of changing climate conditions, AWAC have included additional considerations into the design criteria for new facilities and expansions/ upgrades of existing operations.

Risk Areas	Risk Descriptions	Actions
Transitional: Regulatory responses (current and emerging) from governments worldwide to control greenhouse gas emissions.	The increased scrutiny by governments on GHG emissions and the establishment of carbon pricing mechanism, emissions trading schemes, carbon taxes etc present a challenge and a financial risk to the business. Cost of emissions abatement. Rising cost of energy. Energy is a significant input in a number of AWAC's operations, making AWAC an emitter of greenhouse gases. The introduction of regulatory change by governments in response to greenhouse gas emissions may represent an increased cost to AWAC and may affect Alumina Limited's profitability.	AWAC uses financial modelling to quantitatively assess the economic impact of enacted and proposed cap & trade and other climate/energy measures. Also, to reduce the financial risk of cap & trade schemes, Alcoa has adopted aggressive annual, incentive-based targets and long term CO^2e and energy targets for all its operating facilities which include the AWAC operations. Securing low-cost, low-environmental-impact and long-term energy is an important focus and adopting developing technological advances.
Market changes and perceptions	Consumer demand for the end product of aluminium may change or the market's preference for greener products and energy could impact on access to finance and social licence.	Continual monitoring of markets and community trends. Seize on opportunities of utilising aluminium in reducing the carbon footprint in the transport and construction industries.

How this is managed

In 2018, Alumina Limited commenced a review to identify climate-related risks and opportunities for AWAC/Alumina over the short to long term. This assessment considered AWAC's current energy mix, opportunities for transitioning to less emissions-intensive energy use, downstream demand forecasts for aluminium, physical risks to AWAC operations, regulatory and market risks (including carbon and energy prices) and standards for disclosure of climate risks.

We will continue to work with Alcoa (AWAC's manager/operator) to assess climate change risks and opportunities across AWAC. Alumina Limited seeks to positively influence climate related issues for AWAC through co-operation with Alcoa.

- We are working with Alcoa on developing climate change scenario analysis to better understand and 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 AWAC's assets.
- With the assistance of expert independent consultants, we are incorporating climate change risks into Alumina's Investment Approval Framework.

Alumina Limited recognises that the impacts and risks from changing climate patterns is a significant challenge facing society. It represents a challenge to wide-ranging aspects of the natural environment and therefore impacts on physical, social and economic well-being of all people. Worldwide, governments, corporations and individuals are pledging to do their part to limit temperature increase and hopefully contribute to halting and reducing the impact of climate-change.

WASTE

Alumina and aluminium processing create a range of waste products, the most significant by volume being bauxite residue from the refining process. It consists of a sand and mud (almost in equal parts) slurry that contains some residual caustic soda.

Other notable waste items are:

- mercury emissions, which occur through refining operations; and
- spent pot lining (SPL), the waste produced from aluminium smelting process when the carbon and refractory lining of smelting pots reaches the end of its serviceable life.

Why this matters to us

Waste in any form demands proper waste management to protect the environment and for the health and safety of the population. Alumina Limited and AWAC believe in proper waste management.

Bauxite residue is the largest waste produced in the refining system. Every metric tonne of alumina produced results in approximately 1.5 metric tons of bauxite residue (depending on bauxite quality). After 40 plus years of operation, AWAC's refineries have accumulated enormous amounts of residue that require environmentally safe disposal. Bauxite residue is stored in impoundments that are capped and re-vegetated when full. Recent catastrophic failures of non-AWAC tailing impoundments have highlighted the major risk to people, the environment, and the business.

AWAC, including its minority interests in the CBG mine in Guinea and the MRN mine in Brazil, have 79 tailings or residue storage facilities, of which 44 are active. Thirty-eight of the total number of facilities have been constructed using the upstream method, 25 of those are active. Thirteen upstream facilities exist in Brazil, of which only one is active.

How this is managed

Responsible residue or tailings impoundment management requires a comprehensive approach.

AWAC focuses on key elements of management and governance necessary to maintain the overall integrity of our residue storage areas including the implementation of:

- a governance structure that provides global oversight with clearly defined location responsibilities;
- globally mandated standards covering planning, design, construction and operations;
- long term strategic master plans;
- timely implementation of capital projects;
- qualified personnel in key roles, such as civil engineering oversight at each location;
- review and assurance, such as peer reviews of storage area design and third party audits/inspections;
- risk management, with facilities in place to manage extreme events; and
- emergency preparedness and response plans for unforeseen or extreme events.

Technology is also employed to minimise waste through innovative processes and alternative uses for waste products. These are priorities that will reduce AWAC's environmental footprint. In 2016 AWAC commissioned residue filtration processes at the Kwinana alumina refinery in Western Australia which uses very large filters to extract water from bauxite residue. A similar filtration unit is due for commissioning at AWAC's Pinjarra alumina refinery. The water obtained via the process is recycled back into the refinery process. Application of this technology has deferred the need to construct another 30-hectare residue storage area for at least 20 years, compared to every five years previously. This technology reduces freshwater use by 1.2 gigalitres per annum.

Performance

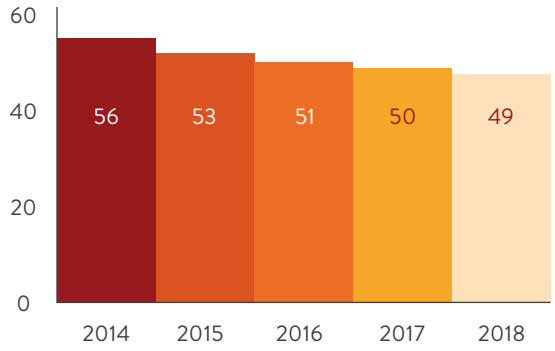
In February 2018 Alcoa initiated a review of its systems and processes for managing residue and tailings at AWAC's operations to ensure compliance with best practice. The review has been performed with the assistance and input of an appropriately qualified external consultant and recommendations are being implemented.

The long-term strategic goal is to reduce bauxite residue land requirements per tonne of alumina produced by 15 per cent by 2030. In 2018, AWAC had achieved approximately a 2.0 percent improvement in the land required and a 5.8 per cent improvement since the 2015 baseline.

In 2018 AWAC produced approximately 22.0 million tonnes of bauxite residue as a result of its global refining activities. This is in line with the performance of 2017 and represents a marginal decrease of 0.1 million tonnes compared to 2016.

Bauxite residue storage efficiency*

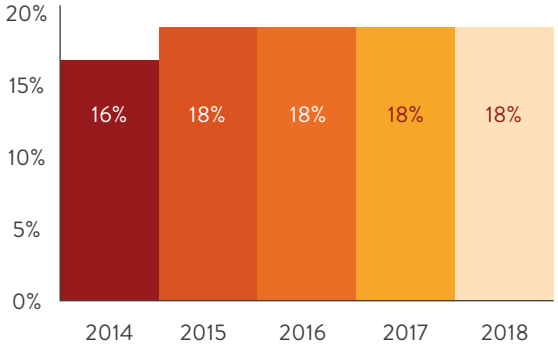
Square metres of land required per thousand tonnes of alumina produced



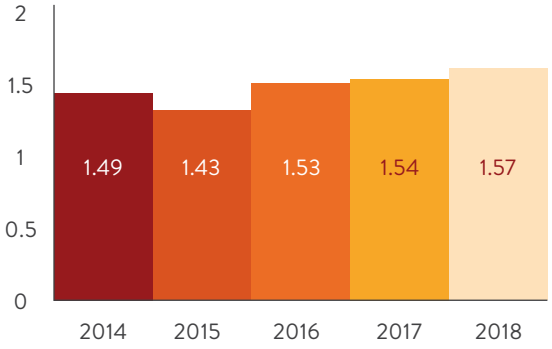
*Although predominantly AWAC bauxite residue storage areas, the results against targets does include non-AWAC bauxite storage at Alcoa's Pocos de Caldas refinery in Brazil

Bauxite residue storage area rehabilitation

Percent of total area rehabilitated



Bauxite residue intensity



The increase in bauxite residue intensity from 2016 was due to the curtailing of refineries that had lower residue-to-alumina ratios.

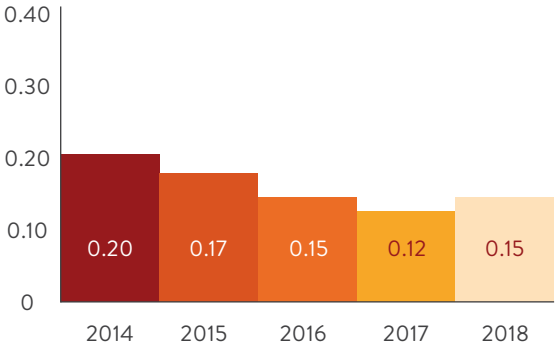
Bauxite Residue Reuse

Due to the high volume of residue produced each year, the per cent recycled or reused in comparison is minimal and is insufficient to disclose in graphic form.

Mercury emissions

Mercury is a naturally occurring element found in bauxite. Mercury concentrations vary along with bauxite quality and location, and this variability adds to the challenge of reducing emissions. Alcoa will continue to research technology and operational solutions to achieve improved outcomes. In 2018, AWAC reduced the intensity to approximately 0.15 grams per metric ton of alumina produced.

Mercury emissions intensity



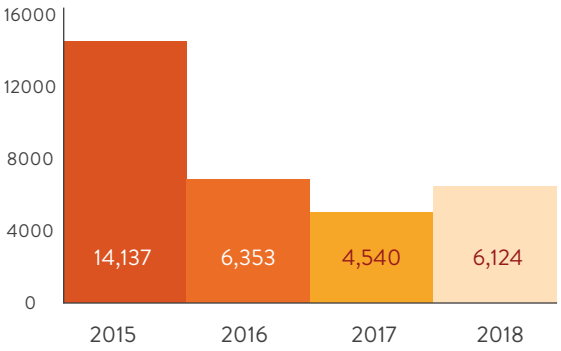
	metric tons		
	SO2 Emissions	NOX Emissions	HG Emissions
2017 Total AWAC	10,879	11,186	1,819
2018 Total AWAC	12,508	10,846	2,154

SO2 emissions were higher in 2018 than 2017 due to the Portland smelter recovering production following the shutdown of a potline for a substantial part of 2017 due to a power outage in late 2016.

Waste to landfill

In 2018, AWAC operations waste to landfill increased due to waste at the Portland aluminium smelter resulting from the disposal of material from the power outage that 'froze' a potline.

Land filled waste - metric tons



On the upside, AWAC's end product – aluminium can also be endlessly recycled, using only five per cent of the energy required to make the original metal.

WATER

Water is one of the most important elements for sustaining life. Water forms an essential raw material for AWAC and is used in:

- bauxite ore refining into alumina;
- dust suppression, road watering and vehicle and equipment cleaning throughout mining operations; and
- ingot-casting process during smelting.

Why this matters to us

AWAC's management of water resources is vital to its:

1. licence to operate, which is granted by local communities, governments and environmental agencies, and
2. mitigation of business risks by ensuring business continuity.

Water scarcity has the potential to impact AWAC's costs, production volume and financial performance. In AWAC the largest water users are the alumina refineries. Most material to Alumina Limited is AWAC's operations in Western Australia, which is recognised as a region subject to water-stress, having experienced changing rainfall patterns in recent years leading to a drying climate.

The global water challenge is becoming more complex due to stress applied from:

- changing weather patterns;
- growing populations;
- expanding urbanisation; and
- increasing agricultural and industrial sectors.

Global water management issues require future technology advances combined with full community, government and business involvement and cooperation.

How this is managed

Alcoa of Australia has undertaken several initiatives to conserve water, increase water efficiency and reduce water quality requirements, which include:

- Bauxite residue filtration.
- Pursuing secondary sources of water as an alternative to fresh water used in several refining processes.
- Projects aimed at recycling water already used in processing to reduce total water withdrawals.
- Projects evaluating applications to slow evaporation of stored water.
- Increasing pasture coverage on and around bauxite residue areas to suppress dust and remove needs for water sprinklers.

Alcoa has focussed on developing and implementing innovative and low-cost management technologies. AWAC's Kwinana alumina refinery in Western Australia reduced its freshwater use by 1.2 gigalitres annually after investing in innovative technology of residue filtration. The residue filtration system forces bauxite residue through very large filters that squeeze out water that can be reused in the refining process.

Performance

During 2018, construction of a residue filtration residue processing plant at Pinjarra, the largest refinery in AWAC's system, continued with planned commissioning in 2019. In 2017, AWAC operations worldwide withdrew 28.3 million cubic metres of freshwater comparable to the 2017 result.

Freshwater intensity measured by cubic metre/tonne of production (refining and smelting combined).

	2014	2015	2016	2017	**2018**
Refining	1.75	1.66	1.83	1.62	**1.45**
Smelting	1.26	1.17	1.05	1.26	**1.08**
Total intensity	4.58	4.32	4.52	4.34	**3.84**

2018 Freshwater1 withdrawal by source (millions of cubic metres).

	2014	2015	2016	2017	**2018**
Total	36.2	34.4	31.4	28.3	**28.3**

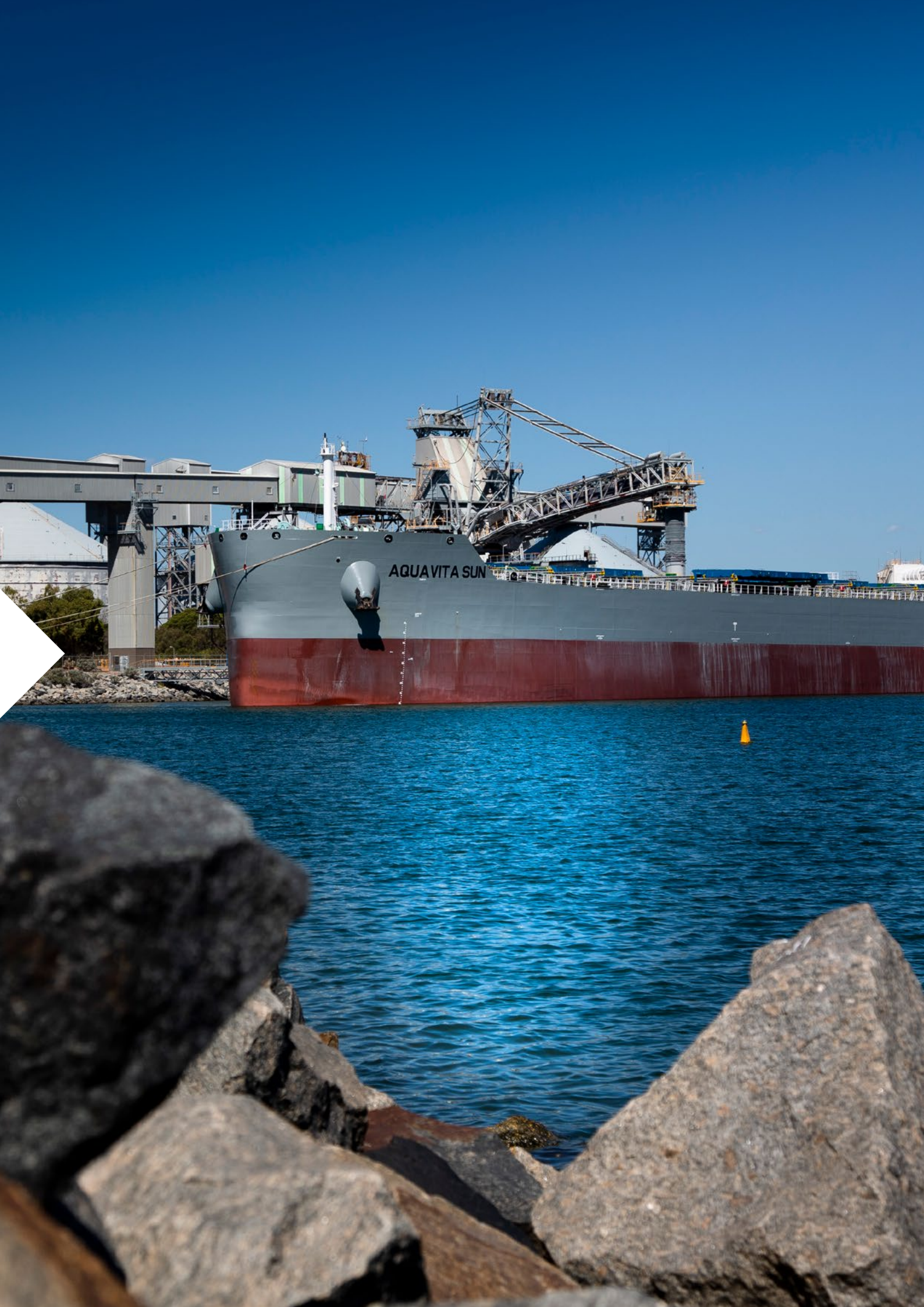
Freshwater sources include:

- Groundwater pumped from or derived from wells, springs, or bores that is used for process/potable purpose;
- Water purchased from a municipal water authority or other provider (including the output from a desalination plant);
- Water pumped from rivers, streams or lakes that is used for process/potable purpose; and
- Water produced from onsite and/or offsite, third party desalination systems.

Freshwater does not include:

- Water pumped from or derived from saline sources, (i.e., oceans, seas, & saline aquifers) and used as is for process water;
- Fresh water that is supplied to local users (communities, adjacent industrial users) by the facility;
- Fresh water that is extracted from ground water for purposes of lowering the ground water table and is not used for process/potable use; and
- Water derived from recycled sources that is being reused as process water.

Commencing in 2018, Alcoa is setting a new strategic target to define and implement a program focussed on enhancing water-use efficiency in water-scarce areas such as the Western Australian operations by 2020 and define specific water-use reduction targets for 2015 and 2030. This will be based on the results of a global water-risk survey being conducted in 2018.


AQUAVITA SUN

LAND AND BIODIVERSITY

Why this matters to us

AWAC mines bauxite in the only naturally occurring Jarrah forest in Western Australia and also in the Amazon. AWAC has a goal of minimising environmental impacts and returning the land to its native state or promoting sustainable use of the land mined.

How this is managed

The Rehabilitation Process

Mining of the bauxite ore results in relatively shallow open pits and requires excavating through several layers of soil and sub-soil. The top soil, which is rich with seed and nutrient reserves, is removed and retained for return to the mined area to re-establish native vegetation.

The overburden is then removed to expose the bauxite ore. The overburden may also contain valuable nutrients and microbes necessary to assist with regeneration. Generally, the overburden and any rock removed together with the topsoil is returned immediately to the mine pit (progressive rehabilitation); however, in some cases that is not immediately possible or practical and those materials are stored for later use.

Also, the topsoil can be treated with specially grown seeds and nursery-grown vegetation or, where the plant species are not prone to produce a viable seed bank, to supplement with cuttings and tissue culture propagation.

The rehabilitation process also includes creating an environment for native wildlife to return. This may involve creating habitats from tree trunks and stumps that were removed during mining. These habitats provide protection and an area to recolonise.

Different rehabilitation processes are employed at specific sites due to local conditions. At the Juruti bauxite mine in Brazil a nucleation technique is used which relies on locally adapted plants and animals colonising micro-environments using small mounds of topsoil to create an undulating land scape. This technique is used to help trap surface water and control water runoff during the wet season (300mm of rainfall).

Biodiversity

Biodiversity management is a major part of the mine rehabilitation process. It is an essential practice for operations near regions where there are significant flora and fauna species (such as the Jarrah forest Darling Range of Western Australia, and at Juruti near the Amazon in Brazil) areas recognised as sensitive eco-systems.

Decisions on future land use and preparation of rehabilitation plans are contingent on determining and maintaining the biodiversity of the area. In assessing the reconstruction of biodiversity in rehabilitated areas, tree establishment and growth are regularly monitored. This includes reviewing the concentration of undergrowth and diversity. Regular reviews are also undertaken on establishment of birds, mammals, reptiles and insect life. Ground and surface water levels and quality is also monitored.

Our Western Australia operations have extensive programs around the management of soil erosion, weeds, feral animals, and forest pathogens to minimize impacts on biodiversity.

AWAC have also committed to avoiding legally designated protected areas where strict nature conservation is the management objective. Prior to developing an area, AWAC conducts extensive evaluations of the areas biodiversity to determine future rehabilitation programs. Evaluations include monitoring plant growth, density and diversity. A review is also conducted of birds, mammals, reptiles and insects.

AWAC's Western Australian mining operations, the Juruti mine in Brazil and the Portland aluminium smelter in Australia have developed and implemented biodiversity action plans that will serve as models for other locations.

Land disturbance and rehabilitation

In regard to mining operations, AWAC operates under the mandate that mining is a temporary use of the land and it supports returning mined land to a sustainable future. In most cases that means returning the land to its pre-mining condition with the same diversity of plant and animal species.

Bauxite mining, which is done in relatively shallow pits, accounts for the majority of land that is disturbed as a result of AWACs operations. As the joint venture is committed to minimising the disturbance of the original habitat, it works closely with community and regulatory stakeholders to restore those lands AWAC impacts, to the most productive use possible, including, where feasible, re-establishing pre-operating conditions.

Some AWAC operations are within or adjacent to protected areas or sensitive biodiverse areas.

Operational Site	Site Location & Size	Position	Biodiversity Value
Huntly and Willowdale bauxite mines (active)	Jarrah Forest, Western Australia - 712,900 hectares (1,761,614 acres)	Within protected area	Recognised by Conservation International as an international biodiversity hotspot; threatened species and ecological communities (International Union for Conservation of Nature – IUCN – and federal government listed)
Anglesea Power station (coal mine and power station closed in August 2015)	Anglesea, Victoria Australia - 787 hectares (1,945 acres)	Within and adjacent to protected area	Adjacent land zoned for conservation and listed on the National Estate Register; threatened species and ecological communities (IUCN and federal government listed)
Wagerup alumina refinery	Wagerup, Western Australia - 6,000 hectares (14,826 acres)	Contains portions of area of biodiversity value	Ramsar listed wetlands adjacent; threatened species and ecological communities (International Union for Conservation of Nature (IUCN) and federal government listed)
Portland aluminium smelter	Portland, Victoria Australia - 500 hectares (1,236 acres)	Adjacent to protected area	Threatened species and ecological communities (International Union for Conservation of Nature (IUCN) and federal government listed)
Juruti bauxite mine (active)	Juruti, Brazil - 29,426 hectares (72,713 acres) that will be mined	Within protected area	Amazon rainforest and river; threatened species and ecological communities (IUCN listed)
Coermotibo bauxite mine (bauxite mine that ceased operation in October 2015)	Marowijne District, Suriname - 32,800 hectares (81,051 acres)	Adjacent to protected area	Adjacent to IUCN protected area; threatened species (IUCN listed)
Point Comfort alumina refinery (alumina refinery that was curtailed in 2016)	Point Comfort, Texas USA - 1,417 hectares (3,501 acres)	Adjacent to protected area	Native grassland and intertidal emergent marsh (protected under the Clean Water Act); threatened species (IUCN and federal government listed)

Performance

Mining Land disturbed/Land Rehabilitated

	2014	2015	2016	2017	**2018**
Open mine area	14,371	13,702	14,155	15,448	**15,769**
Area disturbed (Annual)	1,235	1,086	977	1,178	**1,243**
Area rehabilitated (Annual)	1,008	1,293	646	1,008	**923**

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

Area disturbed for mining and associated infrastructure (hectares)

Region	2014	2015	2016	2017	**2018**
Australia	818	756	631	675	**675**
South America	417	330	346	448	**520**

*expressed in hectares

Area disturbed means annual land used in each reported year for mining or for mining infrastructure (eg. roads, shops, crushing equipment, conveyors). In Brazil, the area disturbed increased in 2017 and 2018 due to additional clearing necessary for long-term infrastructure associated with the expansion of AWAC's Juruti mine. In Australia, the small increase in 2017 was due to slightly higher clearing for active mine areas at both the Huntly and Willowdale mines.

Area rehabilitated (hectares)

Region	2014	2015	2016	2017	**2018**
Australia	576	550	290	412	**550**
South America	266	564	242	486	**260**

*Annual figures. Area rehabilitated means annual land returned to natural conditions or to productive use (such as farming) after mining or decommissioning of mine infrastructure in each reported year. The reduction in area rehabilitated in 2016 was mainly due to a range of operational constraints at the Huntly mine in Australia and reduced areas returned to the Government of Suriname during 2016. In Australia in 2018, the increased area rehabilitated was partly due to the commencement of rehabilitation of haul roads in the previous crusher region of McCoy and the execution of a closure plan at the Anglesea mine. In South America, a reduction in area rehabilitated in 2018 was due to slower-than-expected retirement of previously mined lands in Suriname.

People

At the core of the AWAC business is its 5,171 employees (2018) who run the operations worldwide. Their safety and wellbeing, motivation and job satisfaction are key to operating a sustainable and successful business. Finding, employing, developing and retaining skilled people is also crucial to AWAC's future competitiveness and success.

AWAC WORKFORCE

AWAC Operations	2014	2015	2016	2017	**2018**
Alumina & bauxite	6,289	6,128	4,866	4,834	**4,897**
Aluminium	403	301	274	266	**265**
Chemicals & steamships	7	9	6	7	**8**

In Brazil, there are eight standalone labour agreements that cover 100 per cent of AWAC's union-represented workforce. Typically, these are renegotiated on an annual basis.

No significant non-compliances or fines on human rights or labour grounds arising from either Alumina Limited's activities or through AWAC's worldwide operations were recorded in 2018.

Why this matters to us

The safety and wellbeing of employees at work is a fundamental human entitlement, as is the right to be heard and collectively bargain and freely associate. Alcoa works to strengthen a culture that promotes safety as the priority concern in all work activity and supports employee dignity and labour rights worldwide.

We recognise that not all impacts from AWAC's activities are positive, which strengthens the importance of sustainability governance.

ALUMINA LIMITED'S EMPLOYEES

In 2018, Alumina Limited had a small professional management team of 12 members to manage our interest in the AWAC joint venture. While all employees have individually negotiated contracts, they have the right to freely associate and collectively bargain in line with our Human Rights policy.

Approximately 75 per cent of AWAC employees are based at AWAC's Australian operations.

Most of AWAC's employees are covered by enterprise bargaining agreements. Alumina Limited and Alcoa both support the rights of employees to collectively bargain and freely associate.

In Australia, approximately 66 percent of employees are covered by enterprise bargaining agreements.

Anti-Corruption Program

AWAC's Anti-Corruption Policy reflects Alcoa's strong commitment to conducting its operations around the globe ethically and in compliance with all applicable laws. Our directors and management believe that the way results are achieved is as important as the results themselves. Vigilance in complying with anti-corruption and anti-bribery was, including those based upon the OECD Convention, the U.S. Foreign Corrupt Practices Act, and other local anti-corruption laws, is critical for a global company.

The Anti-Corruption Program includes:

- Anti-Corruption Policy
- Due Diligence Review Process for Intermediaries
- Gifts and Hospitality Procedure
- In person and web-based trainings
- investigations and 24/7 Reporting Line
- Monitoring, audit and assessment.

Alumina Limited supports Alcoa's position and has developed similar policies and practices to protect both employees and stakeholder groups.

Annually, Alumina Limited employees are trained on the Human Rights and Anti-corruption Policies.

SAFETY AND HEALTH

Why this matters to us

As a non-operating partner in AWAC, Alumina Limited views workplace safety and health as a key performance indicator because:

- It is a fundamental right for employees, contractors and visitors to be safe at work.
- It demonstrates the level of management control and expertise that Alcoa brings to operating the AWAC joint venture.
- A safe work environment encourages work participation and attendance, which drives productivity and performance.

Managing safety in AWAC's complex mining and manufacturing environment requires strong systems as well as a focussed safety culture committed to continuous improvement. As the operator, Alcoa has invested substantial intellectual, financial and system resources over several decades to understand the key drivers behind safety behaviour, with the sole aim of eliminating fatalities and serious injuries from AWAC's operations. Alcoa's stated goal for a healthy workplace is to eliminate all health hazards that could potentially affect employees, contractors, and other individuals within their managed facilities which includes AWAC's global operations. If elimination is not feasible, Alcoa reduce the risk to the fullest extent possible.

Following thorough investigations, action plans were developed for short- and long-term risk reduction.

How this is managed

In 2018, Alcoa directed its safety focus onto a new safety strategy, targeting systems and culture.

This involved reviewing, benchmarking and updating 14 existing standards and created 11 new safety standards.

Risk-based audits that focused on observing people and processes at the operational level to assess actual risk to employees and contractors replaced the emphasis on reviewing paperwork. The process involved an appropriately trained risk team to observe each site's specific risks. Standards, checklists and permits were also reviewed. A more formal and standardised process for investigating Fatal and Serious Injuries was developed to identify and address root causes of incidents.

In 2018 Alcoa addressed a strengthening of safety culture by planning and implementing actions to further demonstrate that safety is the absolute priority before any production, cost or other matters. This was achieved by first gaining an understanding of the existing safety culture through a series of focus groups. Opportunities for improvement were identified. That lead to the development of a safety leadership standard to assist site managers understand their roles and responsibilities in nurturing a supportive safety culture.

A new health framework was introduced by Alcoa at AWAC sites in 2018, based on:

- Health hazard controls to prevent occupational disease;
- Health status and fitness for work to ensure an employee's health status is compatible with assigned work;
- Community and public health, which facilitates AWAC's licence to operate; and
- Personal and health and well-being.
- Deployed enhanced risk-based assess templates for all health focus areas to support locations in their efforts to eliminate their specific health hazards.
- Within AWAC's alumina refining operations began piloting a prototype of a new medical evaluation process that improves focus and efficiency.

Performance

Fatalities by Gender

Employees/contractors

	Male	Female
2014	0/1	0
2015	0/1	0
2016	0/0	0
2017	0/2	0
2018	0	0

Lost Workday Rate

Employees and supervised contractors

	Global	Australia	Europe	North America	South America
2014	0.17	0.42	0	0.50	0.06
2015	0.16	0.2	0	0.23	0.09
2016	0.31	0.41	0	0	0.14
2017	0.315	0.458	0.141	1.042	0.169
2018	**0.203**	**0.403**	**0.137**	**0.00**	**0.065**

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

Lost Workday incidents by Gender

Employees and supervised contractors

	Male	Female	Total
2014	22	1	23
2015	11	0	11
2016	20	0	20
2017	32	2	34
2018	**28**	**1**	**29**

Days Away, Restricted and Transfer Rate

Employees and supervised contractors

	Global	Australia	Europe	North America	South America
2014	0.51	0.86	0.12	1.01	0.09
2015	.039	0.42	0.12	0.92	0.09
2016	0.16	0.23	0	0	0
2017	0.575	0.859	0.562	3.127	0.211
2018	**0.567**	**0.980**	**0.683**	**1.922**	**0.232**

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.

Days Away, Restricted and Transfer Incidents by Gender

Employees and supervised contractors

	Male	Female	Total
2014	46	1	47
2015	23	0	23
2016	9	1	10
2017	59	3	62
2018	**73**	**8**	**81**

Total Recordable Incident Rate

Employees and supervised contractors

	Global	Australia	Europe	North America	South America
2014		2.06	0.46	4.36	0.40
2015		1.0	0.36	4.72	0.09
2016	1.49	1.60	0.91	4.49	0.57
2017	1.299	2.082	0.703	4.169	0.465
2018	**1.261**	**2.485**	**0.956**	**3.844**	**0.504**

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.

Total Recordable Incidents by Gender

	Male	Female	Total
2014	127	6	133
2015	81	2	83
2016	84	6	90
2017	132	8	140
2018	**175**	**17**	**192**

Alumina Limited's Results

While Alumina Limited has a relatively small operational footprint, we focus on our safety performance through training. There were no recordable injuries for the year or Lost Work Days as a result of incidents.

EMPLOYEE ENGAGEMENT AND AGREEMENTS

Why energy matters to us

Employee satisfaction and a good understanding of the employee needs is critical for maintaining a motivated, committed and developing workforce.

How is this managed

In 2018 at AWAC operations, a new Human Relations system was introduced with new engagement indices that involve short, focused surveys that focus on topics such as employee experience, inclusion and trusting workplaces.

AWAC's bauxite business unit focused on lead team development across the portfolio. This process used a group approach, leadership teams came together to align, share best practices and improve coaching skills.

All employees and many contractors have access to a global online learning management system for tracked training.

People development training included the use of interactive webinar tools and resources that taught employees how to drive check-in discussions while management learned how to provide ongoing coaching and support their employees.

DIVERSITY AND INCLUSION

Throughout AWAC's operations, diversity, equality and inclusion is valued and actively encouraged. The intent is that every person feels accepted and valued and has access to the same opportunities and fair treatment.

Why this matters to us

Generating a culture of acceptance and inclusion means that the workplace is a safe place where people, irrespective of gender or race feel comfortable.

How is this managed

At AWAC a key is engaging with employees to determine what is important to employees. In 2017 a workplace survey on diversity and inclusion was conducted to understand areas for improvement. Conclusions from the survey were incorporated into a trusting workplaces program in 2018 that included policies on Harassment and Bully-Free Workplace and Equal Employment Opportunity.

In 2018 there was a continued focus on increasing the number of women in the workforce. At AWAC's Australian operations were named top employer for gender equality. Diversity and inclusion are standing agenda items at leadership meetings.

In 2018, 10 per cent of leaders' annual incentive compensation formula was dedicated to meeting the diversity target of increasing female representation in the workforce at all levels by 15%.

Performance

At the Juruti mine in Brazil, 21.7 per cent of the workforce were women compared to 17.3 per cent when the mine opened in 2009. The steady growth of women holding leadership and operational positions has been enabled through the direct engagement of AWAC's Bauxite business unit's leadership and the involvement of the Alcoa Women's Network.

In Australia, the Women in Operations program assists top female talent to take on operational and leadership roles within AWAC's bauxite and alumina operations. The program includes personal development, networking with leaders, external training and mentoring. The first 27 women graduated in 2018. Also, in AWAC's Australian operations, 30 per cent of new apprentices were females.

GRI index

102-1	Name of the organisation	About this Report P4
102-2	Activities, brands, products, and services	About This Report P5
102-3	Location of organisation's headquarters	About Alumina P4
102-4	Location of operations	About this Report Map of operations P8
102-5	Nature of ownership and legal form	About this Report P5
102-6	Markets served	Map of operations P8 View (Profile)
102-7	Scale of the organization	Performance P20 View (Profile)
102-8	Information on employees and other workers	People P48
102-9	Supply chain	Supply Chain P25
102-10	Significant changes to the organization and its supply chain	No changes (N/A)
102-11	Precautionary Principle or approach	
102-12	External initiatives	View (Values, Policy and Practice) P14
102-13	Membership of associations	Memberships P25
102-14	Statement from senior decision-maker	Chairman & CEO Overview P6
102-15	Key impacts, risks, and opportunities	Risk P24 Climate Change Impacts P38
102-16	Values, principles, standards, and norms of behaviour	View (Code of Conduct) P14
102-17	Mechanisms for advice and concerns about ethics	View (Values, Policy and Practice) P14
102-18	Governance structure	Governance P23 Sustainability Governance P24
102-19	Delegating authority	AWAC governance framework P14
102-20	Executive-level responsibility for economic, environmental, and social topics	AWAC governance framework P22–23
102-21	Consulting stakeholders on economic, environmental, and social topics	Community P26
102-22	Composition of the highest governance body and its committees	Governance P22
102-23	Chair of the highest governance body	Governance sustainability P22
102-24	Nominating and selecting the highest governance body	Governance P24
102-25	Conflicts of interest	View (Governance)

102-26	Role of highest governance body in setting purpose, values, and strategy	Governance P24 AWAC governance P24
102-27	Collective knowledge of highest governance body	AWAC governance P24
102-28	Evaluating the highest governance body's performance	View (Board performance evaluation) P4
102-29	Identifying and managing economic, environmental, and social impacts	View (Risk management) P25
102-30	Effectiveness of risk management processes	View (Risk management) P25
102-31	Review of economic, environmental, and social topics	View (Audit and Risk Committee Role) P12 View (Board and Committee Meetings 2018) P7
102-32	Highest governance body's role in sustainability reporting	In 2018 the Board reviewed the structure of the Report and the material aspects and the CEO signed-off on the final content
102-33	Communicating critical concerns	View (Communication Strategy) P19 View (Whistleblower) P4
102-34	Nature and total number of critical concerns	2018 Stakeholder issues P27
102-35	Remuneration policies	View 2018 Remuneration P42
102-36	Process for determining remuneration	View (Remuneration 2018) P52
102-37	Stakeholders' involvement in remuneration	View (Remuneration 2018) P52
102-38	Annual total compensation ratio	Information not available for AWAC
102-39	Percentage increase in annual total compensation ratio	Information not on hand for AWAC
102-40	List of stakeholder groups	Stakeholders P16
102-41	Collective bargaining agreements	View (Employee profile) P45
102-42	Identifying and selecting stakeholders	Stakeholders P18
102-43	Approach to stakeholder engagement	Stakeholders P17
102-44	Key topics and concerns raised	View (Stakeholders) P27–29
102-45	Entities included in the consolidated financial statements	View (Annual Report) P 71
102-46	Defining report content and topic Boundaries	About this report P2
102-47	List of material topics	Materiality P18
102-48	Restatements of information	No restatements apply
102-49	Changes in reporting	Not applicable
102-50	Reporting period	About this report P2
102-51	Date of most recent report	2018
102-52	Reporting cycle	About this report P2
102-53	Contact point for questions regarding the report	About this report P5

102-54	Claims of reporting in accordance with the GRI Standards	About this report P2
102-55	GRI content index	GRI index P54
102-56	External assurance	About this report P5
103-1	Explanation of the material topic and its Boundary	Materiality P2
103-2	The management approach and its components	under each material topic
201-1	Direct economic value generated and distributed	Economic contribution P30
201-2	Financial implications and other risks and opportunities due to climate change	Climate change impacts P38 View (Climate change)
203-2	Significant indirect economic impacts	Economic contribution P30
205-2	Communication and training about anti-corruption policies and procedures	Anti-corruption program
302-1	Energy consumption within the organization	Energy & emissions P35
302-3	Energy intensity	Energy & emissions P35
303-3	Water withdrawal	Water P42
303-5	Water consumption	Water P42
304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	Biodiversity P44
304-2	Significant impacts of activities, products, and services on biodiversity	Biodiversity P44
304-3	Habitats protected or restored	Biodiversity P44
305-1	Direct (Scope 1) GHG emissions	Energy & emissions P35
305-2	Energy indirect (Scope 2) GHG emissions	Energy & emissions P35
305-3	Other indirect (Scope 3) GHG emissions	Energy & emissions P35
305-4	GHG emissions intensity	Energy & emissions P35
305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	Waste P40
306-2	Waste by type and disposal method	Waste P40
306-3	Significant spills	Waste P40
307-1	Non-compliance with environmental laws and regulations	Waste P40
403-1	Occupational health and safety management system	Safety P50
403-9	Work-related injuries	Safety P50
413-1	Operations with local community engagement, impact assessments, and development programs	Community engagement P26
415-1	Political contributions	Political donations P25