

Reinventing for a sustainable future





0

employee and contractor fatalities

15.4%

decrease in landfilled waste



0.57

days away, restricted and transfer rate per 100 full-time workers



0.82:1

ratio for active mining disturbance to mine rehabilitation for the 2017 to 2021 period



9.1%

decrease in carbon dioxide equivalent emissions

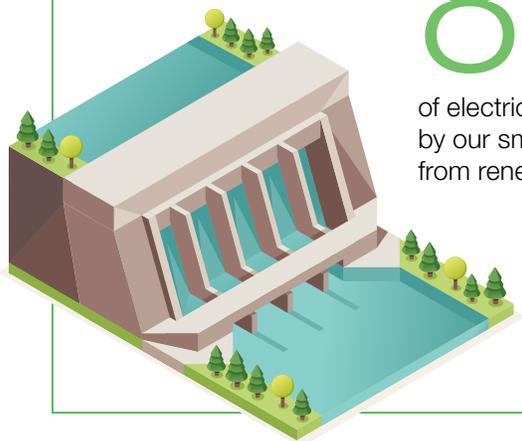
0.4% decrease in energy intensity



Approximately

81%

of electricity consumed by our smelters was from renewable sources



0.8%

decrease in freshwater use intensity



17.2%

of our global employees are women



Developed a social performance management system called

SP360

400

targeted employees trained in social performance fundamentals



US\$11.15

billion in purchased goods and services



US\$7.2

million in Alcoa Foundation community investments



2.4%

reduction in bauxite residue land requirements per metric ton of alumina produced



95

score on the Corporate Equality Index 2021¹



5,700

employee volunteer hours in the community

¹ Human Rights Campaign Foundation (highest score is 100)



About this photo: Alcoa's Fjarðaál, Iceland smelter

Forward-looking Statements

This report contains certain statements that relate to future events and expectations and, as such, constitute forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Forward-looking statements include those containing such words as "aim," "ambition," "anticipates," "believes," "could," "develop," "estimates," "expects," "forecasts," "goal," "intends," "may," "outlook," "plans," "potential," "projects," "reach," "seeks," "sees," "should," "targets," "will," "working," "would" or other words of similar meaning. All statements that reflect Alcoa's expectations, assumptions or projections about the future, other than statements of historical fact, are forward-looking statements. Forward-looking statements by Alcoa are not guarantees of future performance and are subject to known and unknown risks, uncertainties and changes in circumstances that are difficult to predict. Although Alcoa believes that expectations reflected in any forward-looking statements are based on reasonable assumptions, it can give no assurance that these expectations will be attained, and it is possible that actual results may differ materially from those indicated by these forward-looking statements due to a variety of risks and uncertainties. For a discussion of some of the specific factors that may cause Alcoa's actual results to differ materially from those projected in any forward-looking statements, see the risk factors described in Part I Item 1A of the Alcoa Corporation Annual Report on Form 10-K for the fiscal year ended December 31, 2021, filed with the Securities and Exchange Commission on February 24, 2022. Alcoa disclaims any obligation to update publicly any forward-looking statements, whether in response to new information, future events or otherwise, except as required by applicable law.

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Some of the photos contained in this report were taken prior to the onset of COVID-19 and may not represent current Alcoa protocols for social distancing and masks.

Materiality

Throughout this report, materiality refers to sustainability topics based on definitions developed by third party disclosure frameworks, which are different than the definitions used for filings with the U.S. Securities and Exchange Commission (SEC). Topics covered by this report may not be considered material for SEC reporting or other regulatory purposes and should not be confused with definitions of materiality that apply to information disclosed by Alcoa for such purposes.

From the CEO



Now, more than ever, our world needs reinvention.

In society's collective pursuit of a more sustainable future, we need new technologies and solutions that can help decarbonize global supply chains while enabling local communities to thrive.

The aluminum industry has an essential role to play. Aluminum is lightweight, strong, and infinitely recyclable. It can replace plastic and heavier metals in applications ranging from product packaging to electric vehicles, all while advancing sustainably.

As an integrated upstream aluminum company, Alcoa provides the building blocks for a better tomorrow. We responsibly mine bauxite and then convert it into alumina via a refining system that has the world's lowest average carbon emissions. Our global smelters are predominantly powered by renewable energy sources.

While our products are essential for modern life, our industry has an opportunity to accelerate the pace of change and prioritize responsible production practices. We trace our legacy to the invention of the aluminum industry in 1886, and this history of innovation inspires our vision to reinvent the aluminum industry for a sustainable future.

Guided by our purpose to *turn raw potential into real progress*, our processes, products, and people are helping progress toward our vision, reinventing for a better tomorrow for our business and our stakeholders, including employees, customers, communities, and investors.

Processes

In 2021, we continued to make progress toward decarbonization of our value chain. We announced our ambition to achieve net zero greenhouse gas (GHG) emissions across our global operations by 2050, including Scope 1 and Scope 2 emissions.

To support that ambition, we unveiled a comprehensive roadmap of future-oriented research and development projects that have the potential to transform refining, smelting, and scrap recycling. The roadmap includes the ELYSIS™ zero-carbon smelting joint venture technology that eliminates all greenhouse gas emissions from the traditional smelting process, emitting pure oxygen. We are actively designing the Refinery of the Future, a program of processes and projects that aims to decarbonize the alumina refining process.

Also, we are ramping up our ASTRAEA™ recycling process. Currently at bench scale, this technology can purify underutilized scrap, producing high-purity aluminum that far exceeds the quality of a smelter's commercial-grade aluminum. This technology can further unlock the infinite recyclability of aluminum, including using underutilized shredded scrap that is prevalent in automotive scrap yards.

We remain focused on supporting biodiversity conservation. In 2021, we updated our Biodiversity Policy to reflect our commitment to contribute toward halting deforestation globally. Through the Alcoa Foundation, we partnered with the Wildlife Conservation Society, The University of Queensland, and The Biodiversity Consultancy to develop tools that can help reduce the drivers of biodiversity loss from industry.

Products

By taking steps to lower carbon emissions in our operations, we can deliver products that can help decarbonize global supply chains. In 2021, we continued to support a growing low-carbon aluminum market through our Sustana™ brand, the industry's most comprehensive portfolio of low-carbon products. Most notably, we announced a deal to supply a mix of low-carbon EcoLum™ metal and metal from the ELYSIS™ joint venture for the wheels on Audi's flagship electric sports car, the Audi e-tron GT.

We continued to earn Aluminium Stewardship Initiative (ASI) certifications for our operating locations, including Performance Standard certifications for two additional smelters in Canada. At the end of 2021, 15 of our operating facilities were certified to the ASI Performance Standard, and we had 14 operating locations certified to ASI's Chain of Custody Standard, allowing us to globally market and sell ASI-certified bauxite, alumina and aluminum.

We're also working to investigate new products that can help support the low-carbon transition, including a joint development project with FYI Resources Ltd. in Australia to produce high-purity alumina (HPA) that is used in LED lighting and lithium-ion batteries.

Value for Local Communities and Our People

Unleashing the potential of people and creating value for our communities is among the most important priorities in our sustainability strategy.

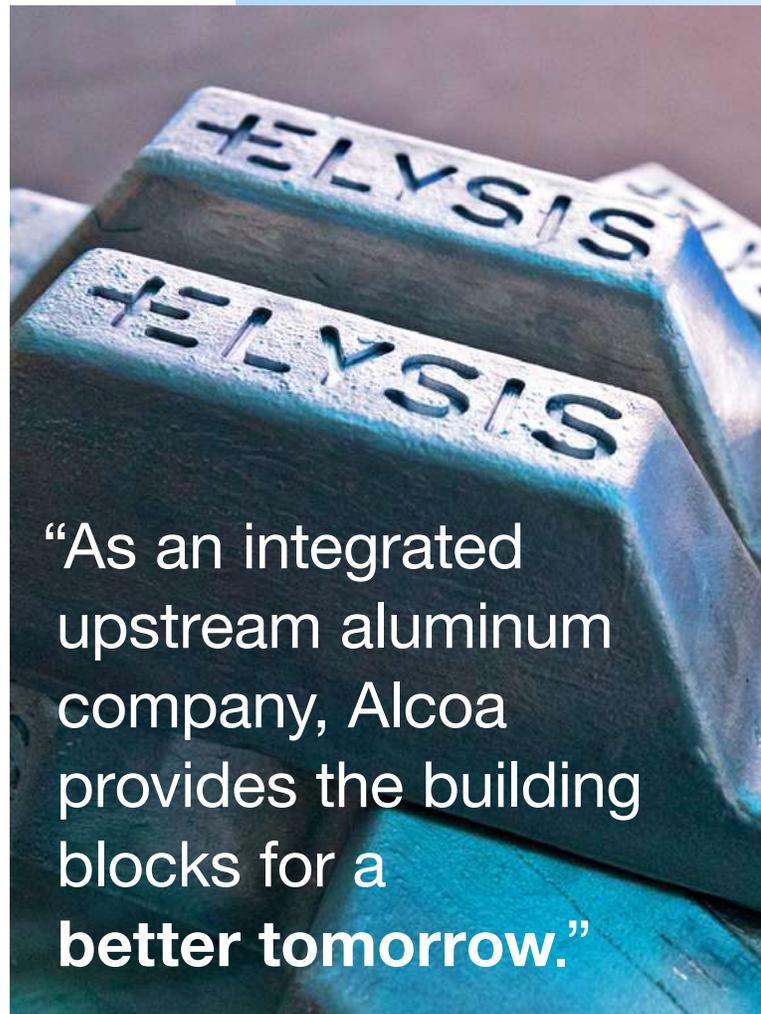
In 2021, we launched a comprehensive social management system designed to integrate social performance into our core processes across the entire business. The Alcoa Foundation continued to build partnerships to drive shared value creation with the communities where we operate. For example, in Guinea, it extended a partnership with the Earthworm Foundation to provide a social training program for 20 Guinean professionals from diverse sectors. And, our Brazilian foundation, Instituto Alcoa, invested more than \$700,000 to promote education and income generation initiatives, among other projects.

Also in 2021, we focused on creating more opportunity and equity for Alcoans everywhere. We continued to grow our global inclusion groups, launched an Everyone Matters self-identification initiative to build a more complete picture of our global workforce, and expanded our Catalyst for Change program where Alcoa managers pledge to personally promote inclusion and diversity.

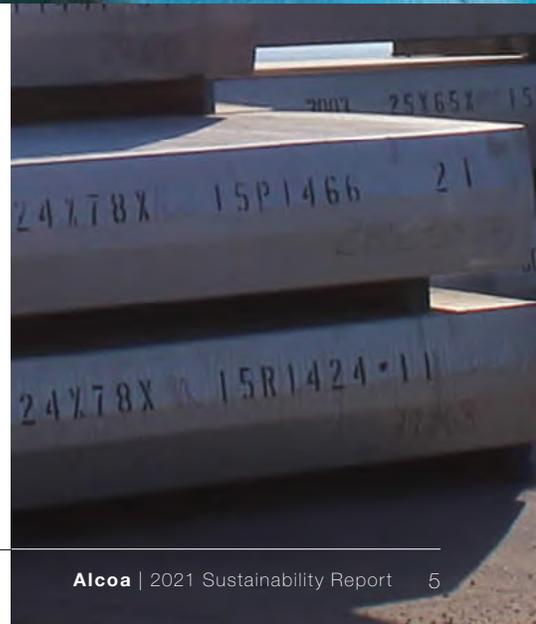
Alcoans across the world are leading with courage to chart a more sustainable future for the aluminum industry, and we made significant progress toward that goal in 2021. I encourage you to read this sustainability report to learn more about these accomplishments and about how we continue to work together with our partners and communities with the aim of building a better world.



Roy Harvey
Alcoa President and CEO



“As an integrated upstream aluminum company, Alcoa provides the building blocks for a better tomorrow.”



Q&A with Alcoa's VP of Sustainability



Rosa Garcia Piñeiro

VP, Sustainability & President
Alcoa Foundation

Q: How has Alcoa's sustainability strategy evolved in recent years to address the challenges and opportunities facing corporations and society?

A: Advancing sustainably has been, and continues to be, a strategic priority for our company. We know that we have an important role to

play in answering society's growing demand for sustainable solutions, and that understanding is reflected in how we operate across our business.

With support from our corporate organization, our operating locations own sustainability and embed it across their day-to-day activities and decision-making processes. Over the years, we've continued to evolve our corporate sustainability targets, as well as our processes and governance structure, to help chart our path forward and support our operations.

Last year, we charted a vision for our company: to reinvent the aluminum industry for a sustainable future. To help us achieve our vision, we've continued to enhance our sustainability targets and strengthen key processes. In 2021, we announced an ambition to achieve net zero greenhouse gas (GHG) emissions across our global operations by 2050, including Scope 1 and Scope 2 emissions.

We introduced a comprehensive social management system called SP360 designed so that our policies and standards at all Alcoa-managed locations support effective engagement with communities, manage our social risks and maintain our social license to operate. We also launched a Social Performance Management Unit to support the implementation and integration of SP360 across the business, working together with locations to operationalize these processes.

Earlier this year, we also created a Sustainability Governance Board comprised of Executive Team members to ensure that we appropriately integrate sustainability priorities within the enterprise strategy and drive sustainable business growth and value creation. The Sustainability Governance Board approves sustainability strategies, evaluates results toward targets and manages sustainability risks. These enhancements are a few examples of how we are helping our operating locations deliver on their sustainability programming and goals more effectively.

Q: Can you tell us more about how Alcoa is partnering with the communities where it operates to deliver social, environmental, and economic value?

A: We are committed to helping our host communities thrive, and that includes protecting critical biodiversity and natural ecosystems, as well as creating economic and social opportunities for people in the community.

From an environmental perspective, we operate in a manner that minimizes our impacts and maximizes ongoing sustainable use. Our Biodiversity Policy requires each site to conduct an environmental assessment that identifies material risks to biodiversity and to implement a biodiversity action plan to manage these risks. For new sites and major expansions of existing sites, the standard sets an ambition of achieving no net loss of biodiversity. In 2021, we updated our Biodiversity Policy to reflect our commitment to contribute to collective efforts to halt deforestation globally by restoring forest ecosystems to all forested areas disturbed by our mine operations.

In terms of community impact, we work to strengthen ties with our host communities as well as to empower our employees across the company. In Brazil and Australia, for example, we work closely with Indigenous communities to build stronger connections, including by creating employment and business partnership opportunities for Indigenous people and Indigenous-owned businesses. We've also continued to strengthen our own inclusion

and diversity programs by expanding our global inclusion groups and rolling out a Catalyst for Change program that ensures manager-level colleagues and above commit to building an “everyone culture.”

The work we are doing is critical, but we also recognize how important it is to collaborate with external stakeholders to help amplify the impact of this work. Through Alcoa Foundation and Instituto Alcoa, our regional foundation in Brazil, we are partnering with leading nonprofits and community organizations to drive positive environmental and social impact.

Alcoa Foundation recently signed a 3-year, \$1.5 million partnership with the International Union for Conservation of Nature (IUCN) to help local nonprofits across more than 12 countries advance programs that support forest conservation and management, energy efficiency and recycling.

Through a partnership with the Organisation of Kaliña and Lokono in Marowijne (KLIM), an Indigenous Peoples association in Suriname, the Alcoa Foundation will help undertake environmental education and protection efforts to preserve the culture and history of eight Indigenous villages and, at the same time, develop nature tourism and an environmental education approach. In Brazil, Instituto Alcoa committed more than US\$500,000 to programs that help our host communities manage the ongoing impacts of the COVID-19 pandemic as well as social and economic development initiatives.

Through our own initiatives, as well as collaborative efforts with other key stakeholders, we’re proud of the value we’re creating in our host communities and beyond.

Q: The circular economy is becoming more important than ever and is considered critical to helping the world achieve climate goals. How is Alcoa helping advance circularity?

A: We expect global aluminum demand to continue to grow, as it is a critical raw material for a low-carbon economy. According to the International Aluminum Institute (IAI), to limit global warming to 1.5-degrees the aluminum industry would need to eliminate 75% of all carbon dioxide emissions from its supply chain by 2035, even though aluminum

demand is projected to grow by more than 30 percent over 2018 levels in that same period. In this context, there is no doubt that the world will continue to need primary aluminum, so we must focus on continuing to decarbonize primary aluminum production. Alcoa has been working with key figures across the industry, including the IAI and the International Energy Agency (IEA), to convert industry-specific targets into a combination of technical pathways and reduction projections. At Alcoa, we’ve announced a technology roadmap of future-oriented research and development projects that have the potential to eliminate direct greenhouse gas emissions from the smelting and refining processes and help achieve our net zero 2050 ambition.

At the same time, however, there is a need to improve recycling rates for post-consumer scrap to meet the growing demand while achieving industry decarbonization ambitions. According to the IAI, the industry needs to increase post-consumer scrap recycling by 55 percent over 2018 levels by 2030.

In support of circularity, Alcoa continuously works with our customers to develop products that are fully recyclable. We’ve also expanded our primary production facilities to incorporate recycling activities where financially viable and sustainable from an environmental and social perspective. A great example of this work is our investment in a remelting furnace at our Mosjoen smelter in Norway.

We are also leading the development of cutting-edge innovation that can dramatically improve circularity opportunities across the supply chain. We recently unveiled ASTRAEAT™, a process that can convert low-quality aluminum scrap into high-purity aluminum at quality levels far exceeding the purity levels at commercial smelters, potentially tapping vast supplies of unused aluminum scrap.

Finally, we’re committed to collaborating with other stakeholders to help create more circularity opportunities. Through the Alcoa Foundation, we are a founding partner of The Recycling Partnership, a national nonprofit organization that leverages corporate partner funding to help increase recycling in states, cities, and communities across the U.S.



Our Net Zero Ambition

Our vision:

Reinvent the aluminum industry for a sustainable future



Our ambition:

Achieve net zero greenhouse gas (GHG) emissions by 2050 across our global operations, including Scope 1 and Scope 2 emissions.

Reduce GHG emission intensity by 30 percent by 2025 and 50 percent by 2030 from a 2015 baseline.

30%

by 2025

50%

by 2030



Our sustainable foundation:

Alcoa operates the lowest carbon-emitting alumina refining system in the world.

Over 81% of our smelting portfolio is powered by renewable energy today, and we are exploring opportunities to power more of our operations in Australia and Brazil with renewable energy.



Through our Sustana™ brand, we offer the industry's most comprehensive portfolio of low-carbon products, including the industry's first low-carbon alumina product.

Our technology roadmap of research and development projects to build the future:

The Refinery of the Future, which aims to enable zero-carbon emissions alumina refining using a combination of processes and technologies under development, including mechanical vapor recompression and electric calcination in combination with a decarbonized grid.



ELYSIS™, a joint venture technology invented by Alcoa that eliminates all greenhouse gases from the traditional smelting process. The venture is already producing metal today that is being used by Apple and Audi and is on track to be offered for commercial application as soon as 2024.



ASTRAEATM technology, a new metal purification process developed by Alcoa for recycling post-consumer aluminum scrap into high-purity aluminum that can be reused across a broad array of applications, which has the potential to create a new value chain. The process is aiming for pilot-scale demonstration by 2023.



Corporate Overview



As a global industry leader in bauxite, alumina, and aluminum products, Alcoa is built on a foundation of strong values and operating excellence, dating back 135 years to the world-changing discovery that made aluminum an affordable and vital part of modern life.

Since our beginning, talented Alcoans have developed breakthrough innovations and best practices that have led to improved safety, sustainability, efficiency, and stronger communities wherever we operate.

Today, we continue that innovation legacy, turning ideas into outcomes. Impossibility into impact. “What if” into “what is.” All with a clear vision – to reinvent the aluminum industry for a more sustainable future.

Founded: November 1, 2016, when Alcoa Inc. separated into two independent, publicly traded companies, creating Alcoa Corporation

Global headquarters: Pittsburgh, Pennsylvania, USA

Purpose: We turn raw potential into real progress

Vision: Reinvent the aluminum industry for a sustainable future

Values: Act with integrity. Operate with excellence. Care for people. Lead with courage.

2021 revenue: US\$12.2 billion

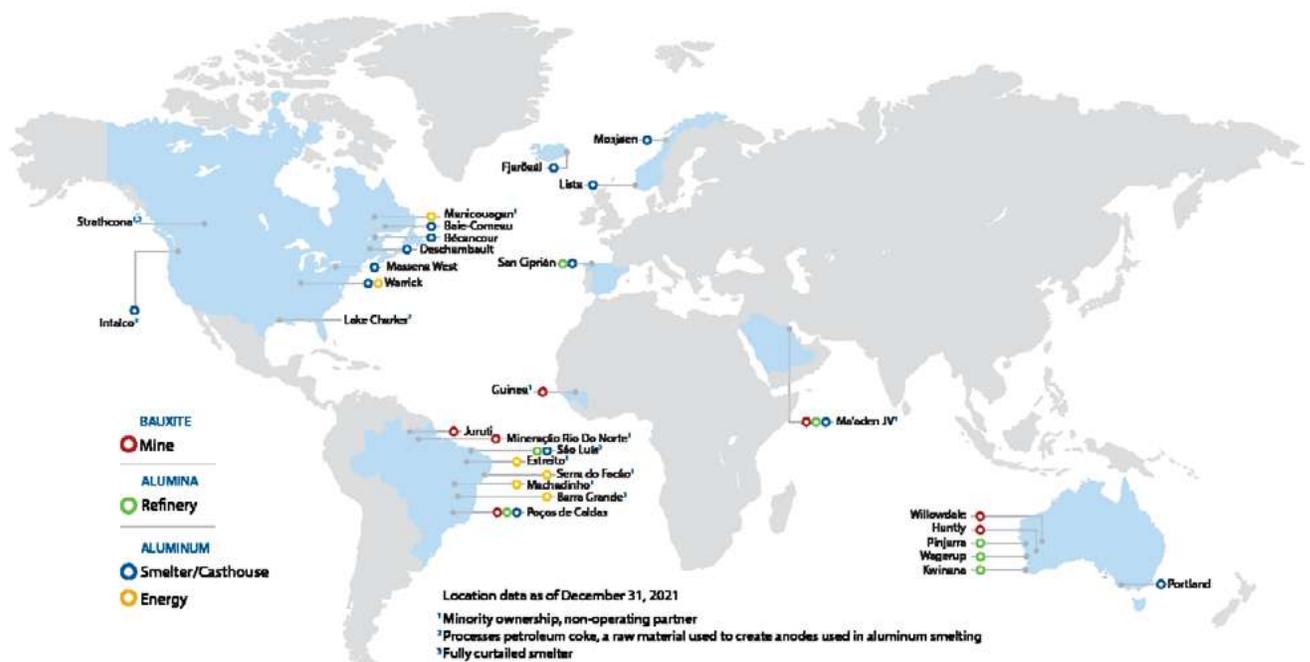
2021 employees: Approximately 12,200

Business Segments

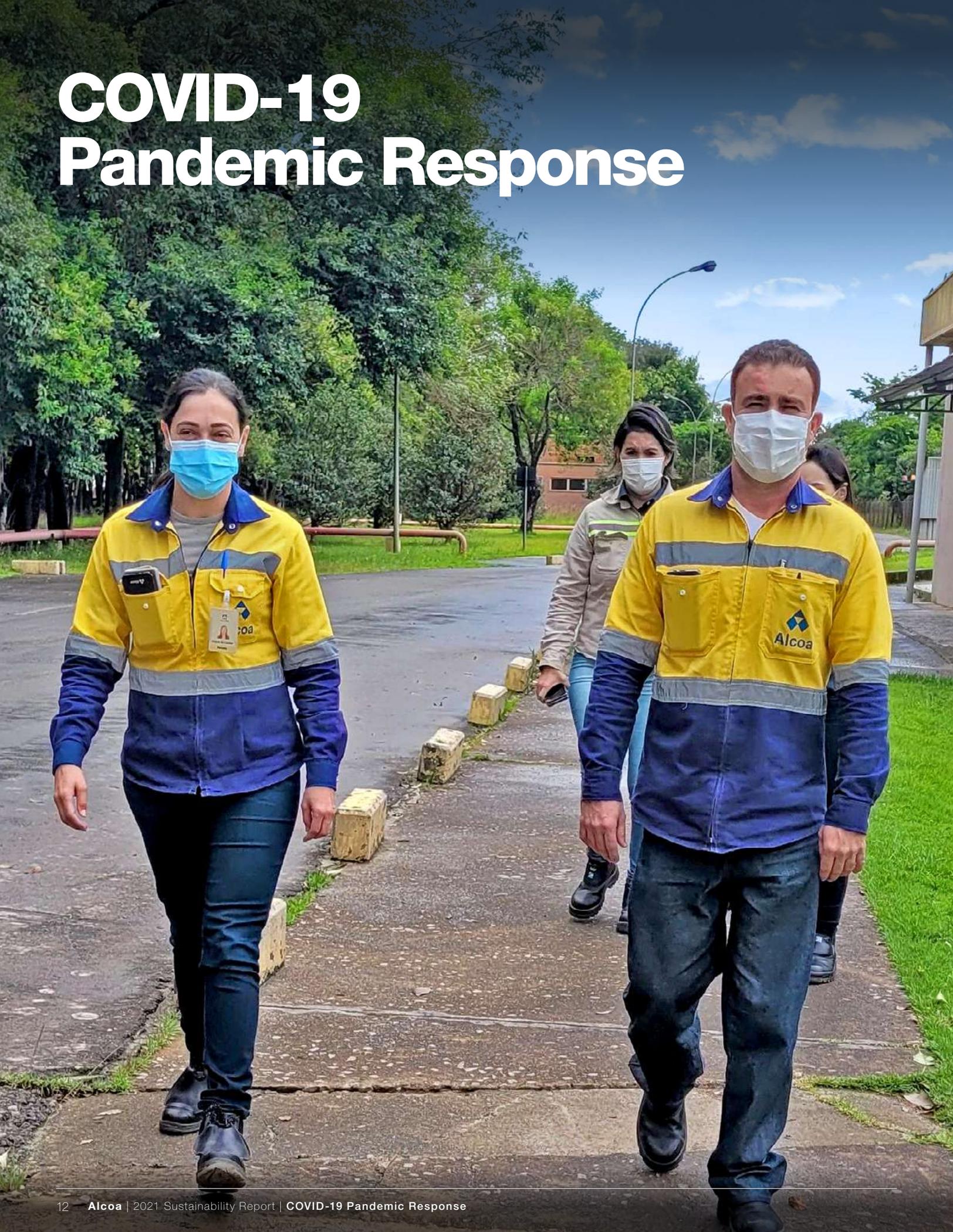
Bauxite: We have ownership in seven active bauxite mines globally and operate four of them in Australia and Brazil. 2021 bauxite production: 47.6 million dry metric tons.

Alumina: We are a world leader in the production of alumina, with ownership in seven refineries. We operate six of them in Australia, Brazil and Spain. 2021 alumina production: 13,259 kmt (thousand metric tons).

Aluminum: This segment includes aluminum smelting and casting, along with the majority of our energy assets. We have ownership in 13 smelters. We operate 10 of them, and two others are fully curtailed. We also have ownership in six energy assets. 2021 primary aluminum production: 2,193 kmt (thousand metric tons).



COVID-19 Pandemic Response



Throughout the ongoing COVID-19 pandemic, our first priority has been to follow health- and safety-based protocols to mitigate the risks from the disease and to protect our employees, contractors, their families and our communities.

Since the onset of the pandemic in the first quarter of 2020, our global operations team has consistently followed and refined our Pandemic Preparedness and Response Plan and Trigger Action and Response Plans (TARPs).

We continued these aggressive and scaled controls throughout 2021 to enable the continuity of our operations. Our Global Crisis Response Team continues to monitor and coordinate our response to the pandemic, working in collaboration with our regional crisis response teams and supporting location resources.

COVID-19 Response

During 2021 we adapted, scaled, and tailored our pandemic response to local circumstances, building on actions taken in the previous year.

COVID-19 Response

Health and Safety	Human Resources	Business Continuity
<ul style="list-style-type: none"> • Business travel policy modifications • Travel health and security support for essential business travel • Return-to-office planning for relevant locations • Point-of-care testing where permitted and deemed necessary • Vaccination efforts • Full or partial resumption of high-importance industrial hygiene and medical services • Analysis and compliance with various regional regulatory requirements or proposals • Quarantine and isolation for active or suspected cases • Monitoring non-essential business travel 	<ul style="list-style-type: none"> • Development of our Flexibility First Project, where employees have the flexibility to determine a work arrangement that aligns to their roles and personal needs • Continued mental health awareness and education • Continued childcare assistance • Acceleration of the modernization of our training function and solutions; for some of our programs, we have fully designed, developed and delivered an in-person and online approach 	<ul style="list-style-type: none"> • Continued open dialogue with authorities, associations and stakeholders to monitor the situation, ensure compliance with regulations and support vaccination campaigns • Adoption of additional controls such as testing and self-check-in apps to resume pre-pandemic routines, including major maintenance, overhauls and capital projects at the operations • Constant employee communications focused on preventive practices

Community Outreach

In response to the continued impact of the pandemic across the globe, Alcoa Foundation diverted US\$450,000 of its annual giving in 2021 to support pandemic relief in the communities where we operate. Since the start of the pandemic, the Alcoa Foundation has provided more than US\$2.5 million in funding for COVID-19 relief. Instituto Alcoa also diverted funding for ongoing relief in Juruti, Brazil.

Examples of 2021 grants include:

- **Australia:** US\$25,000 to Anglicare WA for a range of services for communities facing social and economic difficulties. Funded services included financial counseling, mental health services and support for people experiencing domestic violence.
- **Brazil:** US\$156,000 to various organizations for emergency support in Juruti, including hiring emergency doctors, transporting patients to sites with oxygen services, and purchasing hygiene and medical supplies.
- **Canada:** US\$25,000 to Fondation Santé Portneuf to support long-term senior care shelters with services and activities to reduce anxiety and isolation among elderly residents.
- **Hungary:** US\$25,000 to the city of Szekesfehervar to provide personal protective equipment for frontline workers and support a job assistance program for those impacted by job losses.
- **Spain:** US\$50,000 to the Regional Ministry of Education to provide technological resources for distance learning to students from low-income families and training for teachers serving children with special needs.
- **Suriname:** US\$25,000 to The Back Lot Foundation to support vaccine distribution and logistics, including transportation for a mobile vaccine team, signage for sites and personal protective equipment at the site.
- **United States:** US\$25,000 to Back the Pack to provide healthy snacks and lunches for Massena Central School District students, particularly those from low-income families, when schools were closed.

The foundations will continue to support communities as needed in 2022.

Outcomes

Our first confirmed COVID-19 case was on March 8, 2020 at one of our European locations. At the end of 2020, we had two deaths and 965 confirmed cases among our employees and contractors globally. At the end of 2021, we had 7 deaths and 1,411 confirmed cases, bringing our cumulative total to 9 deaths and 2,376 confirmed cases by the end of 2021.

Our operating locations in Brazil turned a corner by mid-2021. This region represented two-thirds of all confirmed Alcoa cases globally during 2020. Through a public/private partnership, we implemented an organized vaccination effort at all operating locations that led to a very significant downward trend in new confirmed COVID-19 cases in 2021.

Cumulative global cases from the beginning of the pandemic through 2021, by region, are as follows:

Cumulative Global COVID-19 cases

Australia	0	0%
Brazil	1,386	58%
Europe	146	6%
North America	805	34%

Seven locations had 100 or more cases through 2021, representing 89% of all cases to date:

Cases By Location

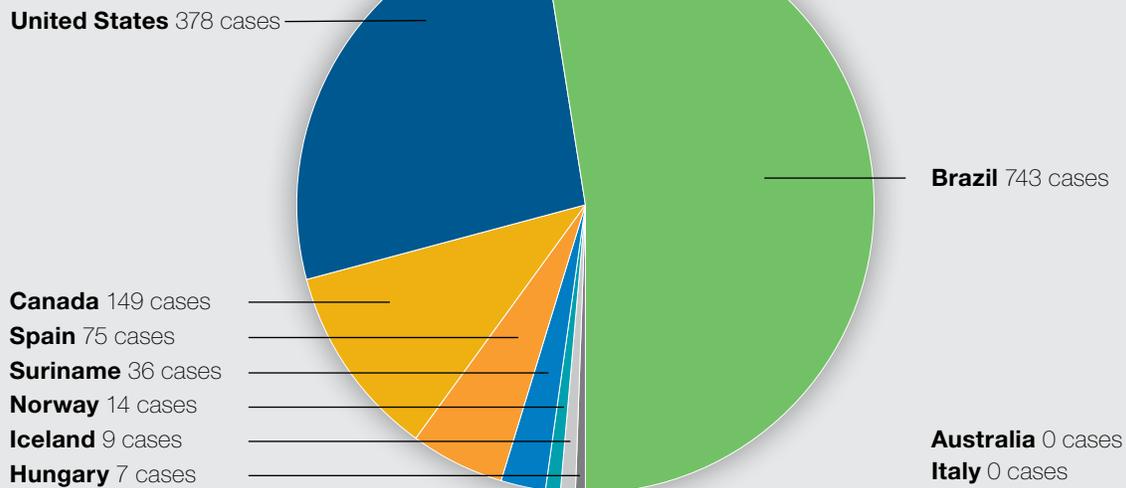
Juruti, Brazil	603	25%
Alumar, Brazil	591	25%
Warrick, U.S.	442	19%
Poços de Caldas, Brazil	182	8%
Bécancour, Canada	105	4%
San Ciprián, Spain	100	4%
Massena, U.S.	100	4%

% = percentage of the cumulative total cases (2,376)

Our employees around the world continue to work tirelessly and selflessly to mitigate the risks from the pandemic, keeping our colleagues safe and our operations running to provide the essential materials we produce. None of our operating locations had to fully or partially close, and we had zero missed or delayed customer shipments due to the pandemic.

2021 Confirmed COVID-19 Cases by Country

Employees and contractors



Data is as of December 31, 2021. Case data for the Netherlands is unavailable due to privacy laws.

COVID-19 Impact

Employees and contractors

	2020	2021
Confirmed Cases	965	1,411
Deaths	2	7
Locations with at Least One Confirmed Case	60%	64%

Data is as of December 31 for each year.

Vaccination

COVID-19 vaccination was an extremely dynamic and evolving situation throughout 2021 and across the globe.

We continue to strongly encourage employees and contractors to get vaccinated to protect themselves, their families, coworkers and others. In 2021, as a private employer, we did not require employees to get vaccinated or to self-report their vaccination status.

As the year progressed, Australian health authorities issued vaccine mandates targeting various sectors and personnel with which our operations had to comply. The legal landscape in other parts of the world represented a continuum of disparate approaches, and our locations managed vaccination in accordance with applicable local laws or anticipated regulations.

During the first half of 2021, vaccination availability and administration were exclusively in the purview of national and sub-national authorities. As vaccine quantities and availability increased by mid-year, some locations were able to facilitate on-site vaccination via third-party resources.

Governance, Ethics and Compliance



At Alcoa, our corporate [Values](#) govern the way we act, operate and how we interact with our customers, communities and each other. We expect all employees to be open, honest and accountable and to adhere to company policies and procedures.

Governance

Our Board of Directors has adopted [Corporate Governance Guidelines](#) and [board committee charters](#) to promote the effective functioning of the board, its committees and our overall corporate governance practices. Information about our Board of Directors can be found on our website.

Ethics and Compliance

COMMUNICATING

Our Ethics and Compliance (E&C) organization manages our corporate policy and procedure governance process. In 2021, we implemented the final step in the governance process by launching an annual review process that is required for each corporate policy and procedure.

We publish a quarterly internal newsletter to communicate important information to employees, such as updates or reminders about codes or policies, messages from leaders reinforcing ethics, and details of upcoming initiatives or training. When we implement a new policy or make significant changes to an existing one, we use the newsletter and other targeted communication to inform employees.

Our global network of Integrity Champions is another means to communicate and reinforce ethical behavior at each of our locations. These employees ensure that ethics and compliance are an integral part of business, promote a culture of integrity, raise awareness of the role of ethics, and serve as trusted advisors and resources.

TRAINING

Annually, we require every employee to complete [Code of Conduct](#) training. The training covers key policies and procedures and topics of importance including conducting business with integrity, prohibiting retaliation, maintaining a drug- and alcohol-free workplace, treating others with respect, using Alcoa's property and resources responsibly and respecting and valuing human rights.

We also require all salaried employees to complete anti-bribery training and the Business Conduct Survey every year. Our E&C team also continued to deploy instructor-led training using virtual channels. This included two courses: anti-corruption training for those employees whose specific roles put them at a higher risk, and a course that emphasizes respect in the workplace.

Respect in the workplace training covers expectations for leaders, including the need to address inappropriate behavior. The training also provides a help chain and reinforces the potential consequences for failing to address inappropriate behaviors that come to the attention of leaders. The training includes examples to demonstrate the types of misconduct that do occur and to share learnings from the investigations.

REPORTING AND INVESTIGATING

Employees and external stakeholders who have ethics-related questions or concerns or want to report suspected breaches of laws, policies, or our Values can do so through our confidential [Integrity Line](#). Accessible 24 hours a day, seven days a week, the line is available in multiple languages. Reports can be submitted anonymously.

We publicize the Integrity Line and directions for accessing it both internally and externally through our external website, internal intranet, Code of Conduct, E&C quarterly newsletters, corporate policies and procedures, trainings, and posters displayed at all locations.

An independent company receives all issues and concerns reported through the Integrity Line and promptly directs them to our E&C organization for follow-up using the following procedures:

- Reporters are given private codes they can reference for updates on the status of their call. The reporter may obtain updates by calling the Integrity Line, checking the web reporting site or contacting the investigator directly.
- Our E&C organization conducts an initial review to determine the most appropriate method of investigation. When appropriate, the E&C organization sends the matter directly to the relevant Alcoa locations for investigations. If any investigation is not appropriate for a location, the corporate E&C organization will handle the process.
- Investigations are handled promptly, thoroughly and confidentially.
- If not anonymous, the identity of the reporter is kept strictly confidential throughout the process and only disclosed to authorized persons, when necessary, to carry out the investigation or as otherwise required by law.
- A final determination is made as to whether the allegation or concern was substantiated or unsubstantiated. The response to substantiated matters is determined on a case-by-case basis and may include disciplinary action, up to and including termination. It is tailored to the seriousness of the substantiated facts.

In 2021, the Integrity Line fielded 185 submissions. Of these, 28 percent resulted in disciplinary action, and 53 percent were inquiries or other matters that did not require investigation or substantial follow-up. The majority of submissions (74 percent) were employment related, with the remainder related to business integrity, health and safety, trade, human rights and general inquiries.

TRACKING AND AUDITING

Our locations worldwide use the Alcoa Self Assessment Tool (ASAT) to validate that internal controls are in place and functioning as designed to protect the company from risks, including ethics and compliance. E&C items evaluated in the ASAT include:

- **Integrity Line:**
 - ✧ Verification that the system is available and operating as expected
 - ✧ Communication of the Integrity Line internally and externally
 - ✧ Establishment of internal controls and business processes to ensure reports submitted to the Integrity Line are handled appropriately
 - ✧ Confirmation that the Financial Fraud Notification Procedure was followed for all fraud investigations and that all allegations that should be escalated to the Audit Committee were escalated per existing Audit Committee Notification Procedure
- **Business Conduct Survey:**
 - ✧ Confirmation that the appropriate population of employees was required to complete the survey
 - ✧ Completion of the survey by 100 percent of required employees
 - ✧ Establishment of a process for addressing the employee disclosures resulting from the survey

Our internal audit team also evaluates E&C implementation and effectiveness as part of its standard audit protocols when conducting full audits of our locations.

In 2021, our internal audit team launched an initiative to change the nature and extent of ASAT testing while focusing on risk points and key controls. The updated process, which will be deployed in 2022, focuses on reducing complexity and duplication of compliance efforts, improving end-to-end risk assessment and monitoring and simplifying maintenance of the control compliance environment.

Testing of E&C items that were formerly tested through the ASAT process, such as the Integrity Line and Business Conduct Survey, will now be tested through a collaborative approach between internal audit and E&C to ensure these controls are operating effectively.

Anti-corruption Program

We have robust processes to prevent bribery and to help ensure compliance with anti-bribery laws in the countries where we operate, including the U.S. Foreign Corrupt Practices Act. We strictly prohibit bribes—giving or receiving anything of value—where it is intended to induce the recipient to misuse their position or to obtain an improper business advantage.

Our anti-corruption program is designed to meet or exceed applicable laws as an effective compliance program as articulated by the U.S. Department of Justice. We do not operate any facilities in countries with the lowest rankings on Transparency International's Corruption Perception Index. (See our [countries of operation](#).)

Our Anti-Corruption Policy and related procedures (Due Diligence and Contracting Procedure for Intermediaries; Charitable Contributions Procedure; and Gifts, Hospitalities and Travel Procedure) are designed to address corruption risk. This policy and corresponding procedures are also reinforced in our annual required training. All employees are expected to understand the requirements and comply with them.

Our Anti-Corruption Policy prohibits bribery of both government officials and private parties and bans facilitation payments.

The Due Diligence and Contracting Procedure for Intermediaries requires:

- A risk-based review of the intermediary and the proposed commercial relationship;
- Approval before commencing business with the Intermediary; and
- Assurances that anti-corruption compliance issues are adequately addressed in contracts and through ongoing monitoring of intermediary relationships.

The Charitable Contributions Procedure ensures that charitable contributions are used for the appropriate and intended purposes and do not conflict with our Values or any applicable laws. This procedure applies to all charitable contributions made with company funds or resources, regardless of value.

The Gifts, Hospitalities and Travel (GHT) Procedure is intended to help employees determine when giving or receiving GHT in connection with company business is acceptable under company policies and any applicable laws, and to outline the steps required to receive approval. Special rules apply for GHT relating to government officials.

Our procurement organization maintains a third-party supplier due diligence program to manage supply chain risk for anti-bribery and corruption, trade compliance, child labor, criminal history, human trafficking and conflict minerals. Our E&C organization supports the program by reviewing potential red flags, monitoring the effectiveness of the overall program and advising on program enhancements.

Our Issue Reporting Policy and Financial Fraud Reporting Procedure provide guidance on the types of issues, including any allegation of corruption, that must be reported to the E&C organization.

All issues or instances of actual or suspected fraud must be reported within 24 hours or as soon as reasonably possible to the chief ethics, compliance, and privacy officer either directly or through the Integrity Line.

Political Contributions

Our [Political Contributions Policy](#) prohibits the use of company funds, property, services or other items of value for political purposes. Rare exceptions may be made, such as favoring or opposing a ballot or referendum vote that can impact our company.

Alcoa Corporation did not make any direct donations to the election campaigns of politicians in 2021. As permitted by U.S. and state law, qualified Alcoa employees voluntarily donated approximately US \$3,500 to U.S. candidates for political office in 2021 through the Alcoa Corporation Employees' Political Action Committee.

Global Privacy Program

We are committed to protecting data privacy. Our privacy strategy is designed to safeguard the interests of all of our employees, customers and third-party vendors. It uses appropriate collection, use and storage of personal and sensitive information in accordance with legal requirements, regulations and contractual obligations. Our global privacy program ensures compliance with the General Data Protection Regulation (GDPR) requirements and the privacy laws in other regions and countries where we do business.

The Privacy Program Office (PPO) within the E&C organization manages the global privacy program. The PPO consists of the chief ethics, compliance and privacy officer and a privacy program manager, who manages the day-to-day business of data privacy compliance.

The goal of the PPO is to create a culture of care and awareness to protect the personal data of Alcoa employees through a risk-based strategy that includes change management, communication, policies, procedures, technology and training. The goal of protecting personal data also applies to those who work for our business partners. Due to the nature of our business, we do not store or manage a notable amount of data related to our customers and suppliers.

The PPO oversees a core Data Privacy Team, which provides additional expertise, leadership and input on strategy, as well as a network of data protection liaison officers (DPLOs).

Managed by our privacy program manager, the DPLOs are appointed representatives from the countries where we have a significant presence and in functions where significant data processing activities take place. They are elected by operational or functional leadership and are an extension of the PPO.

DPLOs attend quarterly meetings where they are briefed on our privacy initiatives and developments. Their primary duties are to assist with answering employee questions and deliver privacy training, communications and presentations.



Our Data Privacy Standard establishes our approach to complying with global data privacy laws and regulations and to define the procedures that underpin our privacy program.

Our Privacy by Design Framework provides controls to ensure that privacy is considered before we purchase, develop, support or implement new services, systems or applications. The goal of the framework is to anticipate, manage and prevent privacy risks in our system development, enhancement and procurement processes.

Within this framework, our Procurement and Information Technology and Automation Solutions (ITAS) functions have special obligations to ensure that privacy is considered from the onset for designing, implementing or purchasing software. We offer specialized training and review sessions to support these functions via live virtual sessions or through our learning management system.

Related Information

[Corporate Governance Guidelines](#)

[Code of Conduct](#)

[Anti-Corruption Policy](#)

[Human Rights Policy](#)

[International Trade Compliance Policy](#)



Legal Compliance



Under the leadership of our general counsel, our Legal Department is responsible for legal compliance and management of our legal risks. As part of these duties, the Legal Department oversees ongoing legal matters, governmental proceedings, and regulatory developments that may affect Alcoa and our subsidiaries and controlled affiliates.

Because of the geographic diversity and complexity of our operations, and in support of these efforts, the general counsel relies upon a global team of in-house lawyers and outside counsel to achieve our legal compliance objectives.

Our in-house lawyers are qualified and experienced in the primary jurisdictions where we have operations, specifically Australia, Brazil, Europe and North America. These lawyers are responsible for ensuring compliance with applicable laws and regulations in their respective jurisdictions, and they advise on reporting obligations and manage ongoing legal matters and proceedings. When needed, external counsel is engaged to address specific areas of expertise or jurisdictions.

The general counsel has designated an in-house lawyer to serve as the primary legal counsel for each operating location and resource function within the company. This lawyer coordinates the legal affairs for the operating location or resource function, including:

- Ensuring compliance with laws;
- Exchanging information on legal matters with the operating location or resource function leadership; and
- Providing legal counseling and preventive law training on issues and topics relevant to the operating location or resource function.

Our Legal Department works closely with other resource functional areas that are tasked with monitoring and ensuring compliance. This includes identifying and maintaining relevant information in specific areas, such as our Environmental, Health and Safety Department (EHS laws and regulations), Human Resources Department (labor and employment laws and regulations) and Ethics and Compliance Department (bribery and anti-corruption and Code of Conduct).

The Legal Department maintains relationships with external legal counsel in various jurisdictions that possess expertise in subject matters relevant to our businesses. As a matter of policy, all external counsel working on our behalf are engaged and managed by Legal Department lawyers to ensure that our lawyers maintain knowledge of, and control over, our legal compliance efforts and any legal matters impacting the company.

Value Creation Process

By transforming natural resources into aluminum, we create value for our stockholders, customers, suppliers and the communities where we operate. It is critical to balance the inputs and outputs to maximize the benefits and minimize any impacts of our processes.

The following simplified analysis of our value creation process identifies our key inputs, outputs and effects on stakeholders. We used this information to help determine our [material topics](#).



Production Process

General Aspects Applicable To All Processes

Key Inputs

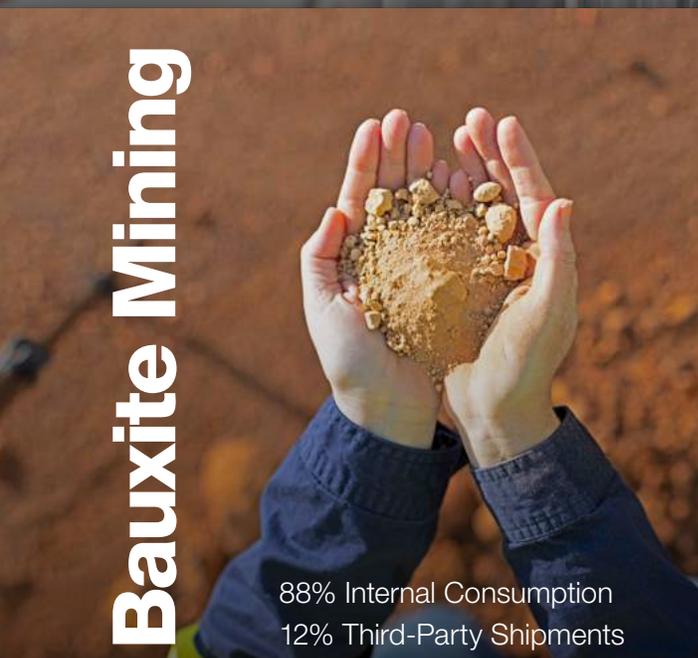
- Financial resources
- Labor
- Governance systems
- Infrastructure

Key Outputs

- Salaries
- Taxes
- Skilled employees
- Products

Key Effects

- Employment stability
- Professional development
- Local economic development
- Environmental impact
- Value for stockholders



Bauxite Mining

88% Internal Consumption
12% Third-Party Shipments

Key Inputs

- Bauxite reserves
- Land surface
- Water
- Fuel

Key Outputs

- Bauxite
- Royalties
- Wastewater
- Air emissions (dust/particulate matter, nitrogen oxides)
- Noise
- Timber
- Rehabilitated land

Key Effects

- Potential community relocation
- Biodiversity disturbance
- Changes to landscape

Data is approximate



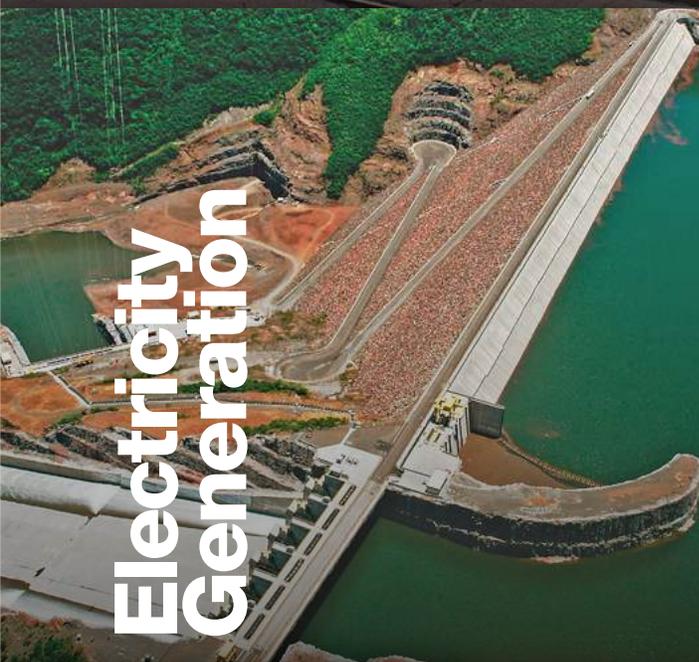
Alumina Refining

31% Internal Consumption
69% Third-Party Shipments



Aluminum Production

100% Third-Party Shipments



Electricity Generation

Key Inputs

- Bauxite
- Water
- Caustic soda
- Lime
- Fuel

Key Outputs

- Alumina
- Bauxite residue
- Air emissions (greenhouse gases, mercury, dust/particulate matter, nitrogen oxides, sulfur oxide)
- Oxalate
- Odor
- Noise

Key Effects

- Changes to landscape
- Potential reduction of water reserves

Key Inputs

- Alumina
- Energy
- Aluminum fluoride
- Carbon and pitch
- Fluxing agents
- Alloying agents
- Refractory
- Aluminum scrap
- Water

Key Outputs

- Aluminum
- Air emissions (greenhouse gases, fluoride, sulfur dioxide, volatile organic compounds, polycyclic organic materials)
- Spent pot lining
- Carbon
- Aluminum dross
- Refractory

Key Effects

- Potential effects on local vegetation
- Contribution to climate change
- Product development (alloys)

Key Inputs

- Water
- Fuel
- Land surface
- Distribution infrastructure

Key Outputs

- Electricity
- Rehabilitated land
- Fly ash
- Air emissions (greenhouse gases, dust/particulate matter, nitrogen oxides, sulfur oxide, mercury)

Key Effects

- Effects on the landscape
- Contribution to climate change
- Biodiversity impacts

Sustainability Approach



In 2021, we announced a corporate Purpose To Turn Raw Potential into Real Progress, and a Vision to reinvent the aluminum industry for a sustainable future. Our Purpose and Vision are underpinned by our Alcoa Values.

Since we started as a company, those three values – Act with Integrity, Operate with Excellence, Care for People – have served as our foundation. In 2021, we added a fourth value, Lead with Courage, that aligns with our Purpose and will help us realize our Vision.

Meanwhile, “advance sustainably” remains one of our company’s three strategic priorities. We believe we can accelerate value creation by answering society’s increasing demand for sustainable solutions, to the benefit of our company, our stakeholders and communities around the world.

STRATEGIC PRIORITIES

Reduce Complexity

Operate our business and assets with a focus on being low cost, competitive and resilient through all market cycles.

Drive Returns

Improve commercial capabilities, invest in targeted growth opportunities and increase margin focus across the value chain.

Advance Sustainably

Transform our portfolio and leverage our industry leading environmental and social standards for a sustainable future.

Our sustainability practice supports Alcoa’s Vision and our strategic priorities through three pillars:

- Sustain our operations, preserve our social license to operate and grow our assets, creating value for the communities where we operate
- Enhance the value of our products through differentiation to improve our profitability
- Reduce risk, minimize negative environmental impacts, and improve our health and safety performance

Our sustainability performance has earned us the credibility and trust to mine bauxite in two of the planet’s most sensitive areas—the Brazilian Amazon forest and the Jarrah Forest in Western Australia. It keeps us in good standing with governments and communities to ensure access to bauxite reserves and enhance our long-term license to operate.

Helping guide our actions are our long-term sustainability goals, which address key material issues for our company and stakeholders. These issues cover the environment, our employees and the communities in which we operate. (See the [Strategic Long-term Goals](#) section.)

Creating Sustainable Value

We actively participate in the communities where we operate, and we want those communities to succeed. We view our presence as an opportunity to help develop and enable economic activity, and to create environmental practices and social programs that are sustainable, remaining well after our role ends. At the same time, being a good neighbor enables our operations to grow and create additional value.

In 2021, we launched a new social management system called SP360. Through this system, we have developed a structured approach for minimizing or avoiding adverse impacts and creating an environment where stakeholders that are directly or indirectly affected by our operations can benefit.

SP360 outlines a methodological approach to managing social and human rights impacts and risks while applying the principles of continuous improvement.

Our social investment is an important part of shared value creation in our host communities. Alcoa Foundation focuses globally on the countries and locations where we operate. It targets its investments on promoting the prevention of, and resilience to, climate change from human activity, restoration and preservation of biodiversity, and education and workforce development, with special focus on vulnerable community groups.

Because of the socioeconomic crisis caused by COVID-19, [Alcoa Foundation](#) continued to channel resources to support humanitarian needs associated with the ongoing global health challenge in 2021. Actions included funding food banks that serve the most vulnerable populations and providing equipment to hospitals and healthcare professionals. More information can be found in the [Alcoa Foundation Annual Report](#).

In addition to the work of Alcoa Foundation, our locations use the Alcoa Stakeholder Engagement Framework to work with stakeholders to identify local opportunities to contribute to the community. (See the [Stakeholder and Community Engagement](#) section.)

Enhancing Product Value

The global markets in which we compete are increasingly affected by significant challenges, including population growth, urbanization, climate change and resource scarcity. Inherently sustainable, aluminum helps our customers address these challenges and capture the opportunities they present.

Aluminum enables safer and more energy-efficient buildings, more fuel-efficient cars, trucks and airplanes, and sustainable food and beverage packaging. It is also infinitely recyclable, reducing energy and resource consumption.

In 2021, we made our first sale of EcoSource™ alumina, which is the world's only smelter-grade alumina made with lower-carbon emitting processes and part of our Sustana™ line of products. This product line allows us to further differentiate ourselves from our competitors. (See the [Products](#) section.)

We continued to pursue Aluminium Stewardship Initiative (ASI) certification to both the Performance and Chain of Custody standards. At the end of 2021, we had 15 operating locations certified to the Performance Standard and 14 operating locations certified to the Chain of Custody Standard. This allows us to globally market and sell ASI-certificated products in all three of our segments.

ASI certification covers a wide range of indicators across the entire value chain in the areas of governance, environmental management and social responsibility. ASI holds a leading role as the most comprehensive third-party system to verify responsible production in the aluminum industry.

We believe that our differentiated products with sustainable attributes create additional value for our customers, helping them achieve their own sustainability targets and those of their customers.



Improving Our Footprint

Despite technological and process advancements, primary aluminum production remains energy- and resource-intensive and also impacts the natural and workplace environments.

Guiding our efforts are our ambitious 2025 and 2030 targets for [greenhouse gas emissions](#), [waste](#), [water](#), [mine rehabilitation](#), [diversity and inclusion](#), [safety and health](#), and [social management](#). Our approach and performance for each can be found in the individual sections within this report.

We also serve as stewards of the land, operating in a manner that focuses on minimizing our impacts and maximizing ongoing sustainable use. Biodiversity management plans, industry-leading mining and mine rehabilitation processes, and asset management that covers a facility's entire life cycle help us optimize our land and facility management and support our social license to operate. (See the [Biodiversity and Mine Rehabilitation](#) and [Facility Stewardship and Transformation](#) sections.)

Our focus on reducing our environmental footprint enables us to reduce our operational costs and future liabilities, such as landfill remediation.

Reporting and Materiality



3 HUMAN RIGHTS



4 RISK MANAGEMENT



5 HEALTH AND SAFETY



6 ENVIRONMENTAL PERFORMANCE



8 RESPONSIBLE PRODUCTION



9 SOCIAL PERFORMANCE



We are committed to transparent and thorough reporting on our sustainability performance.

We base the content of our sustainability reporting primarily on our materiality analysis of sustainability indicators, feedback from our stakeholders, and the requirements of the [Global Reporting Initiative's GRI Standards \(2021 version\)](#), the International Council on Mining & Metals' (ICMM) [10 Principles](#) and [eight Position Statements](#) and the [Metals & Mining Sustainability Accounting Standard](#) of the Sustainability Accounting Standard Board (SASB). The information in this report covers all operations where we have operational control, unless otherwise noted.

In 2019, we engaged a third-party expert to conduct a sustainability materiality analysis to identify environmental, social and governance risks and opportunities. We have used this information to inform our business

and sustainability strategies, more effectively engage with stakeholders and ensure the relevance of our external reporting.

In 2020, we revisited the materiality analysis to determine if our stakeholders had a different view of our business priorities, considering the significant disruptions caused by the global pandemic. There were changes in both issues and prioritization.

We did not consider it necessary to perform a new analysis in 2021 since it was a transition year as the world was recovering from the impacts of the pandemic. We plan to perform a new materiality analysis of sustainability indicators in 2022 to reflect the recovery from COVID-19.

We considered our material issues to be those that internal and external stakeholders ranked as four or higher on a scale of one (not important) to five (critical). The top 14 issues form the basis of our 2021 sustainability reporting.

Material Issues

Rank	Topic	Boundary	Report Section
1	Occupational health and safety	All locations	Safety and Health
2	Ethics, transparency and good governance	All locations	Governance, Ethics and Compliance
3	Regulatory compliance	All locations	Legal Compliance Environmental Compliance
4	Human rights	All locations, particularly those in high-risk areas	Human Rights
5	Waste management	All locations	Waste and Spills
6	Local commitment with communities	All locations	Shared Value Creation
7	Biodiversity and land rehabilitation	All locations, particularly our mines	Biodiversity and Mine Rehabilitation
8	Climate change	All locations, particularly our refineries, smelters and casthouses	Climate Protection
9	Water stewardship	All locations, particularly those in water-stressed areas	Water
10	Air quality	All locations	Emissions
11	Energy use and efficiency	All locations	Energy
12	Economic performance	All locations	2021 Annual Report
13	Indigenous and land connected people	All locations, especially Australia, Brazil and Suriname	Human Rights
14	Impoundment management	Our mines and refineries	Impoundment Management

Material Issues



In 2021, we combined two of the material issues raised in 2020 into one given their existing overlap, reducing our material issues to 14.

The combined material issues were:

- 6. Local commitment with communities: Includes all the actions Alcoa undertakes to create value for the communities where we operate. A key component of this issue is stimulating economic activity at the local and regional levels to improve the quality of life of employees and neighbors. This is done by providing stable, fair-paying jobs, procuring goods and services from local suppliers when possible, paying income and other taxes, and investing in community infrastructure and initiatives.
- 14. Socioeconomic contribution and taxes: Business is a major driver of socioeconomic contribution, which is a major predictor of business success, especially in the long term. By creating jobs, training workers, building physical infrastructure, procuring raw materials, transferring technology, paying taxes, and expanding

access to products and services, companies affect people's assets, capabilities, opportunities and standards.

We combined them under issue number 6, Local commitment with communities.

The 2020 analysis, which used the 2019 results as a baseline, consisted of the following key components:

- Analysis of existing internal documentation on stakeholder input, such as location-specific materiality and stakeholder analyses
- Survey of key employees to capture what they believed are the most significant issues for stakeholders (internal vision)
- Survey of external stakeholders, including those representing customers, communities in which we operate, government, non-governmental organizations and industry associations
- Prioritization of the material issues using matrix above

Assurance

We engaged a third-party firm—[ERM Certification and Verification Services Inc.](#) (ERM CVS)—to provide limited assurance of selected information in this sustainability report. ERM CVS conducted assurance using recognized assurance standards (ISAE 3000 and ISO14064:3). The scope of ERM CVS' engagement addressed selected environment, health and safety key performance indicators, including greenhouse gases, energy, water, and safety performance (via days away, restricted or transfers) and our adherence to ICMM membership requirements.

The following items received limited ERM CVS assurance:

- Scope 1 and Scope 2 greenhouse gas emissions data; ERM CVS also assured the accuracy of the energy consumption data used as a basis for the calculation of these emissions
- Scope 3 emissions data for eight categories:
 - ✦ Purchased goods and services
 - ✦ Fuels and energy-related activities
 - ✦ Transportation and distribution (upstream)
 - ✦ Waste generated in operations (landfill only)
 - ✦ Business air travel
 - ✦ Product transportation and distribution (downstream)
 - ✦ Processing of intermediate products sold to customers (excluding emissions from further downstream processing of alumina from bauxite and aluminum from smelter-grade alumina)
 - ✦ Emissions generated by joint ventures
- Occupational health and safety data, events resulting in fatal or serious injury/illness; incidents resulting in days away, restricted or transfers; and lost workdays
- Water inputs and consumption from operations and locations in Alcoa-defined water-scarce areas
- Landfilled waste, and bauxite residue generated
- Mine rehabilitation data at operating sites

ERM CVS also provided assurance conclusions on the following International Council for Mining and Metals (ICMM) Subject Matters (SM), which are selected disclosures to enhance transparency on critical aspects for the industry:

- SM1: The alignment of our sustainability policies, management standards and procedures to the ICMM Principles and relevant Performance Expectations, as well as mandatory requirements set out in ICMM Position Statements
- SM2: Our material sustainability risks and opportunities based on our own review of the business and the views and expectations of our stakeholders
- SM3: The existence and status of implementation of management systems and approach that we are using to manage each (or a selection) of the identified material sustainability risks and opportunities
- SM4: Reported performance during the given reporting period for each (or a selection) of our identified material sustainability risks and opportunities
- SM5: Disclosures regarding the company's prioritization process for selecting assets for third-party Performance Expectation Validation

The [limited assurance statement](#) is available in the Appendix.

The Aluminium Stewardship Initiative (ASI) is a global not-for-profit standards-setting and certification organization. The ASI Performance Standard defines 59 environmental, social and governance principles and criteria to address sustainability issues in the aluminum value chain.

At the end of 2021, 15 (79 percent) of our operating facilities were certified to the ASI Performance Standard. We also earned ASI's Chain of Custody Standard, allowing us to globally market bauxite, alumina and aluminum with ASI certification. ([View the certifications.](#))

We have developed an environmental product declaration (EPD) covering EcoLum™ aluminum that is part of our Sustana™ family of products. The information has been certified by UL Environment, a third-party assessor.

In addition, 68 percent of our operating plants are certified against the ISO 14001:2015 Environmental Management Systems standard, and 16 percent are certified against the ISO 45001 Occupational Health and Safety Management System standards.

For the remaining information in this report, we relied on our stringent internal controls and management systems to ensure what we report is accurate and representative of our operations.

SUSTAINABLE DEVELOPMENT GOALS



United Nations Sustainable Development Goals

We are committed to contributing to the [United Nations Sustainable Development Goals \(SDGs\)](#).

Our progress against specific SDGs can be found in sections of this report that are marked with the above goal icons.

International Council for Mining and Metals Principles and Position Statements

We are a member of ICMM, which is focused on enhancing the industry's contribution to society with safe, fair and sustainable practices.

As a member, we must meet the commitments of the ICMM 10 Principles, eight Position Statements and all associated Performance Expectations (PEs). Informed by a global public consultation in 2018, the 38 PEs further strengthen membership commitments.

In November 2020, ICMM and ASI published an assessment of how the requirements of the ASI Performance Standard are equivalent to, or different from, ICMM's 10 Principles and associated PEs. The

outcome of the [Equivalency Benchmark](#) is that the ASI Performance Standard meets or exceeds 25 PEs, partially meets 11 PEs and does not apply to two PEs.

In 2021, we developed our approach to self-assess our facilities to the ICMM PEs following the new [Assurance and Verification Procedure](#). Our process consists of certifying our operating locations to the ASI Performance Standard and conducting a self-assessment against the 13 ICMM PEs that are partially met or not met by the ASI Performance Standard.

Of our 15 locations certified to the ASI Performance Standard, two had conducted the self-assessment against the ICMM PEs by the end of 2021. We will complete the self-assessments for the remaining locations in 2022.

The prioritization process for third-party verification following the ICMM Assurance and Verification Procedure has been linked to the ASI certification plan for 2023-2025 cycle. This means that the ASI certification audits will be extended to incorporate the ICMM PEs not fully covered by ASI Performance Standard. We plan to have all our plants certified to ASI and verified to ICMM PEs by the end of 2025.

Our 2021 performance against the ICMM 10 Principles is indicated throughout the report using the following icons.



Principle 1: Apply ethical business practices and sound systems of corporate governance and transparency to support sustainable development.



Principle 6: Pursue continual improvement in environmental performance issues, such as water stewardship, energy use and climate change.



Principle 2: Integrate sustainable development in corporate strategy and decision-making processes.



Principle 7: Contribute to the conservation of biodiversity and integrated approaches to land-use planning.



Principle 3: Respect human rights and the interests, cultures, customs and values of employees and communities affected by our activities.



Principle 8: Facilitate and support the knowledge-base and systems for responsible design, use, re-use, recycling and disposal of products containing metals and minerals.



Principle 4: Implement effective risk-management strategies and systems based on sound science and which account for stakeholder perceptions of risks.



Principle 9: Pursue continual improvement in social performance and contribute to the social, economic and institutional development of host countries and communities.

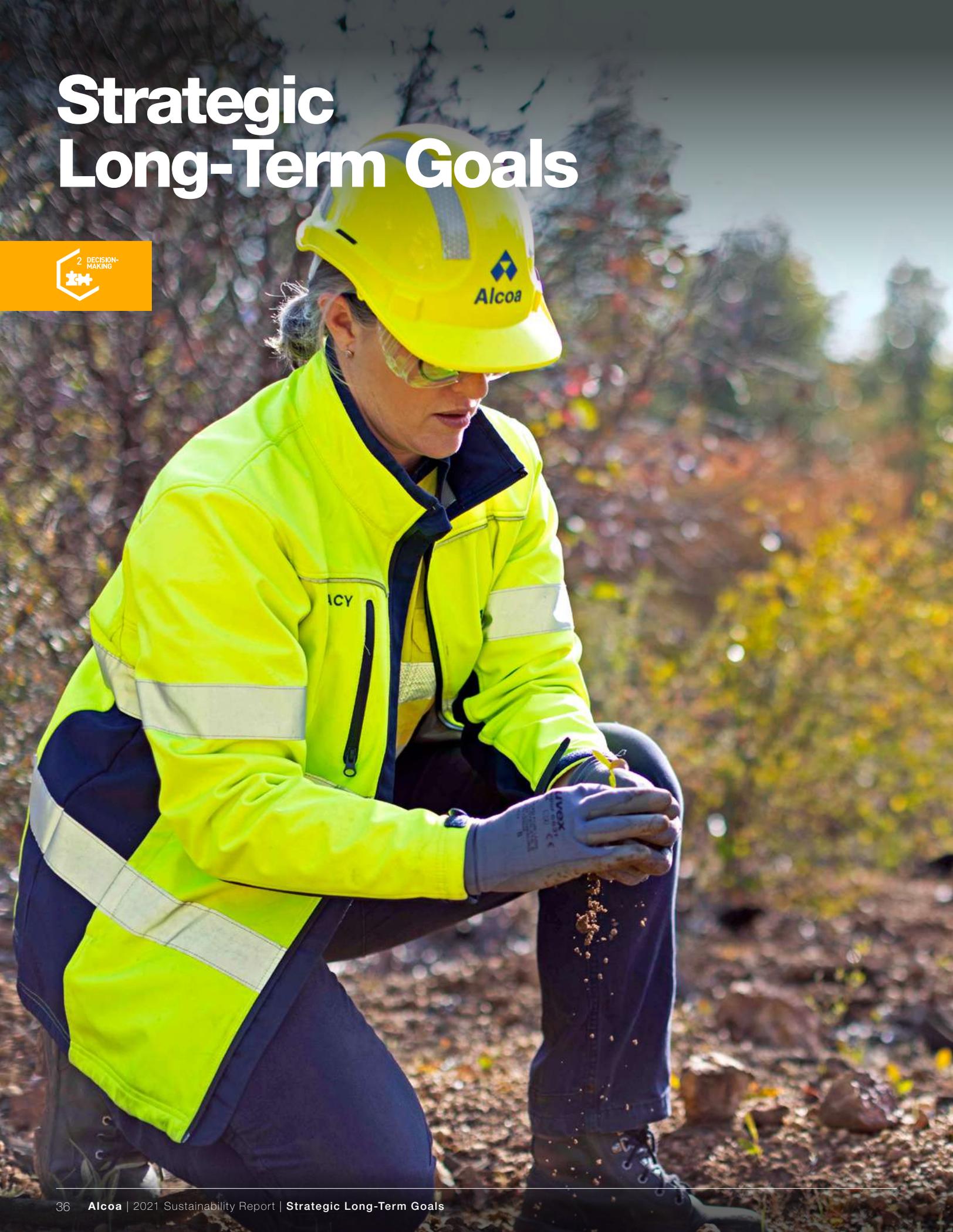


Principle 5: Pursue continual improvement in health and safety performance with the ultimate goal of zero harm.



Principle 10: Proactively engage key stakeholders on sustainable development challenges and opportunities in an open and transparent manner. Effectively report and independently verify progress and performance.

Strategic Long-Term Goals



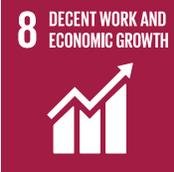
Our strategic, long-term sustainability goals are integrated across our business to drive excellence in environmental management and create value for our stakeholders, including for the communities where we operate.

We review and update these goals on a periodic basis to ensure we are focused on items relevant for our company and its stakeholders.

We began implementing new goals for water conservation, waste management and social management in 2020. We also expanded our existing GHG goal to encompass our alumina refining segment in addition to our aluminum smelting operations.

In 2021, we announced our ambition related to climate change: achieve net zero greenhouse gas emissions (Scope 1 and Scope 2) across our global operations by 2050.

Goal	Progress
<p>Align our GHG (direct + indirect) emissions reduction targets with the below 2° C decarbonization path by reducing GHG emission intensity by 30 percent by 2025 and 50 percent by 2030 from a 2015 baseline. Achieve net zero greenhouse gas emissions by 2050.</p> <p>More</p> <div data-bbox="224 1144 779 1323"> </div>	<p>23.9 percent reduction from 2015</p>
<p>From a 2015 baseline, reduce the intensity of our total water use from water-scarce locations by 5 percent by 2025 and 10 percent by 2030.</p> <p>More</p> <div data-bbox="224 1522 779 1885"> </div>	<p>0.8 percent decrease from 2015</p>

Goal	Progress
<p>From a 2015 baseline, reduce landfilled waste by 15 percent by 2025 and 25 percent by 2030.</p> <p>More</p>  	<p>36 percent reduction from 2015</p>
<p>From a 2015 baseline, reduce bauxite residue land requirements per metric ton of alumina produced by 15 percent by 2030.</p> <p>More</p>  	<p>14.8 percent reduction from 2015</p>
<p>Maintain a corporate-wide running five-year average ratio of 1:1 or better for active mining disturbance (excluding long-term infrastructure) to mine rehabilitation.</p> <p>More</p>  	<p>0.82:1 ratio for active mining disturbance to mine rehabilitation for the 2017 to 2021 period</p>
<p>Zero fatalities and serious injuries (life threatening or life-altering injuries and illnesses).</p> <p>More</p>  	<p>Zero fatalities and three serious injuries in 2021</p>
<p>Attain an inclusive everyone culture that reflects the diversity of the communities in which we operate.</p> <p>More</p>  	<p>Increased percentage of women in our global employee population from 15.6 percent to 17.17 percent</p> <p>The percentage of new hires from underrepresented populations was 38.06 percent</p>

Goal

By the end of 2022, implement a social performance management system at all locations, including the definition of performance metrics and long-term goals to be accomplished by 2025 and 2030.



Progress

Launched SP360 — Alcoa Social Management System that will be implemented through 2022

Risk Management



3 HUMAN RIGHTS



4 RISK MANAGEMENT



5 HEALTH AND SAFETY



6 ENVIRONMENTAL PERFORMANCE



8 RESPONSIBLE PRODUCTION



9 SOCIAL PERFORMANCE





Our risk management process is structured around the [Integrated Framework for Enterprise Risk Management](#) from the Committee of Sponsoring Organizations of the Treadway Commission. It also uses the International Organization for Standardization's ISO 31000 (risk management) as a guideline.

In 2021, we began implementing Operations Risk Management (ORM) in addition to Enterprise Risk Management (ERM). The ORM identifies, evaluates and manages risks across our operations and connects them, if applicable, to enterprise-level risks.

With ERM and ORM, we have comprehensive processes to identify and evaluate a broad spectrum of risks across all aspects of our business. The processes also include an assessment of business drivers, such as reputation, brand, operating margins and earnings.

Our process is multi-dimensional; risks are grouped into categories for management's assessment, monitoring and prioritization. Our processes place a particular emphasis on the likelihood of an occurrence, its level of impact and mitigating factors, such as vulnerability and velocity.

Our sustainability materiality assessment is linked to our corporate risk management process, and is used as additional input to inform the corporate ERM process. This step assures that sustainability-related matters are thoroughly assessed to determine their potential impact and to establish the appropriate management measures. Our ORM implementation also incorporates our sustainability materiality assessment.

This collaborative approach ensures that various levels of leadership are engaged in risk management processes and senior management can easily track and manage risks that could potentially impact the company.

The Alcoa Board of Directors maintains overall oversight of our risk management processes, and the Company's management reports periodically on specific risks.

We have several additional risk management systems that are specific to particular business activities.

These include:

- **New facilities or expansion projects:** When considering any new facilities or expansions, we conduct an environmental and social impact assessment (ESIA) to identify potential risks and opportunities. This process involves significant stakeholder engagement, and the assessment's results are available to the public. The most recent examples of ESIA's conducted for greenfield projects are our Alcoa Fjarðaál smelter in Iceland ([view report](#)) and our bauxite mine in Juruti, Brazil ([view report](#)). At the Baie Comeau smelter in Canada, we conducted an ESIA prior to a retrofit to more advanced technology.
- **Human rights:** We perform human rights risk assessments and due diligence on a periodic basis at our locations. (See the [Human Rights](#) section.)
- **Environment, Health and Safety (EHS):** We have a systematic approach to EHS risk assessment and management at all locations. (See the [Safety and Health](#) section). All locations are required to create emergency response plans, which are tested and shared with communities that potentially could be impacted.
- **Cybersecurity:** We use numerous cybersecurity risk management processes that encompass everything from third-party vendors to vulnerability management. We are also working to align our global security program with the ISO-27001 Information Security Management standard, a globally recognized best-practice security framework with the principles of information technology risk management at its core. This will enhance our management capabilities for information technology and cyber risk.

A discussion of our significant risks can be found in our [Annual Report on Form 10-K](#) for the year ended December 31, 2021. Additional risks and uncertainties not presently known to us or that we currently deem immaterial also may materially adversely affect us in future periods.

Products

7 AFFORDABLE AND CLEAN ENERGY



8 DECENT WORK AND ECONOMIC GROWTH



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



6 ENVIRONMENTAL PERFORMANCE



8 RESPONSIBLE PRODUCTION



Aluminum is the element of possibility and an enabler of low-carbon transition and electrification.

It is lightweight, durable and infinitely recyclable and used in items that touch our everyday lives. Aluminum enables airplanes, cars, trucks, buses, trains and buildings to be more energy-efficient, helping reduce greenhouse gas emissions over the life cycles of these products. It is used extensively in electric vehicles, charging infrastructure and renewable power generation.

The lower the carbon footprint of aluminum, the lower the carbon footprint of the final product. That is why we offer the most comprehensive sustainable product portfolio in the industry. Our Sustana™ family of products comprises:

- **EcoSource™** alumina, made with a low GHG emitting process
- **EcoLum™** low-carbon primary aluminum
- **EcoDura™** aluminum, which has a minimum 50-percent recycled content (pre-consumer scrap estimated using mass-balance approach at facility level)

At the end of 2021, 15 of our operating facilities were certified to the ASI Performance Standard and we also have received certification to ASI's Chain of Custody Standard, which allows our company to globally market ASI-certified bauxite, alumina and aluminum.



Through our [ELYSIS™](#) joint venture, we are working to eliminate all direct GHG emissions from the aluminum smelting process. The ELYSIS technology uses a smelting process first developed at the Alcoa Technical Center that completely eliminates carbon dioxide emissions, replacing that gas and other GHGs with pure oxygen as a byproduct. In 2021, the joint venture began operating commercial-scale tests at the ELYSIS Industrial Research and Development Center in Saguenay (QC), Canada.





Marco Philippi
*Head of Procurement
Strategy, Audi*

“At Audi, sustainability is one of the key criteria we use to select our business partners. When it comes to aluminum in particular, we have high demands on our supply chain. The innovative process from ELYSIS is very promising because it takes effect right from the raw material processing stage and thus already reduces CO₂ emissions during aluminum production. That’s why we decided to offer a rim made of sustainable aluminum for the Audi e-tron GT. The four-door Gran Turismo is a highly emotional and revolutionary electric car, making it the ideal model for sustainably manufactured components.”

In early 2021, Alcoa announced that aluminum produced from the ELYSIS process was blended with our EcoLum aluminum for the wheels on the Audi e-tron GT, the auto manufacturer’s first fully electric sports car. [Learn more.](#)

With our Refinery of the Future program, we aim to unlock decarbonization at scale and deliver a cost-competitive refinery that will help eliminate fossil fuels in operations, reduce freshwater use, and minimize and ultimately eliminate new bauxite residue deposits. Globally, emissions associated with thermal energy used

in the refining process is the third-largest contributor to the aluminum carbon footprint after power- and smelting-related emissions.

In partnership with our customers, we continue to enhance the sustainability attributes of our products. Our Centers of Excellence advance our knowledge and ensure continuous improvement through technology and engineering, best practice sharing and core operation standards.



Bauxite

We are one of the world's largest producers of bauxite, and we operate the world's second-largest bauxite mine, the Huntly mine in Australia. Because our high-quality bauxite is mined responsibly and reliably, it helps reduce supply chain risk for downstream users.

As a company active in all segments of the upstream production aluminum value chain, we are in a unique position to ensure responsible production through every step of our production process.

We first engage with relevant stakeholders before we ever begin mining. This includes developing a rehabilitation plan before mining operations commence. We minimize operational impacts and use innovative techniques to restore biodiversity or prepare former mine lands for future beneficial use. See the [Mine Rehabilitation](#) section for more information.



Alumina

Alumina is refined from bauxite. We are the world's largest third-party supplier of alumina, which we produce from a portfolio of refineries that together have the alumina industry's lowest average carbon dioxide intensity.

Besides carbon emissions, other sustainability challenges in refining are bauxite residue management and water usage, particularly in our three Western Australia refineries where water is scarce. Information on how we are addressing each can be found in the [Water](#) and [Waste](#) sections.

SMELTER-GRADE ALUMINA

We made our first commercial shipments of EcoSource alumina in 2021. This smelter-grade alumina is produced with no more than 0.6 metric tons of carbon dioxide equivalents (CO_{2e}) per metric ton of alumina (including Scope 1 and 2 emissions from bauxite mining and alumina refining processes). This is half the industry average of 1.2 metric tons of CO_{2e} due to a combination of fuel type, fuel efficiency and continuous decarbonization efforts led by our Refining Center of Excellence.

Our alumina is also available with ASI certification.

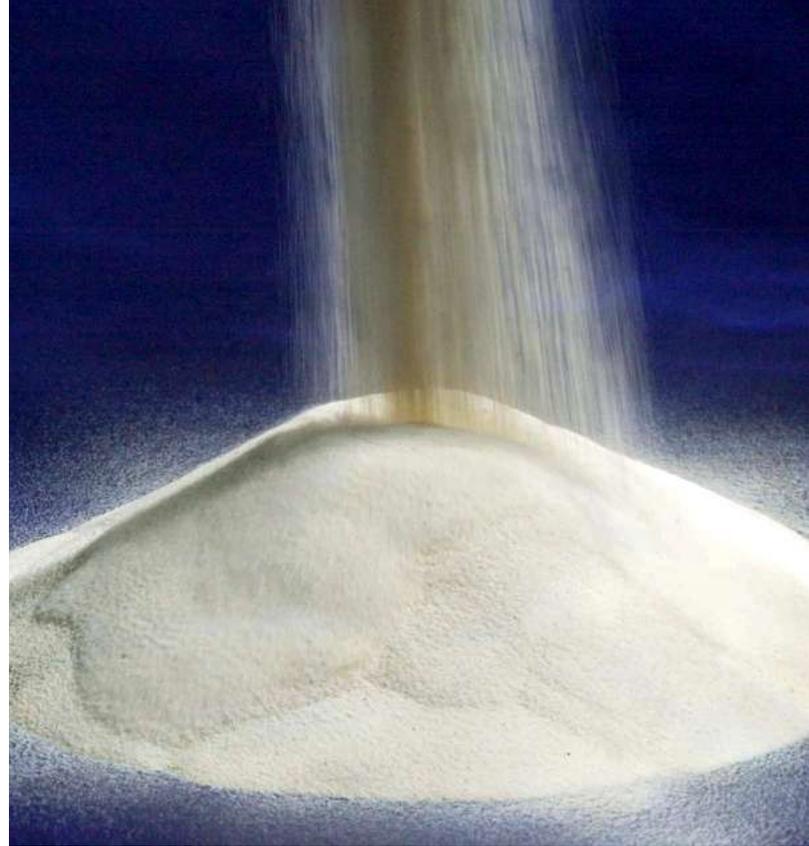
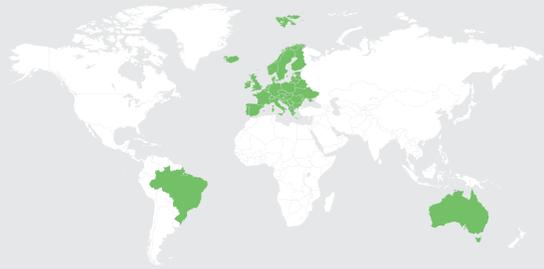
Global Alumina Refining Emissions

Average CO_{2e} emissions per metric ton of alumina produced



Source: Average data per CRU Bauxite and Alumina Cost Model 2020

Region of production (refining)



NON-METALLURGICAL ALUMINA

We are one of the world's largest producers of alumina for non-metallurgical applications (NMA). Though lesser known, this product plays an important role in sustainability since it is used for applications like water treatment.

Our NMA alumina can also be supplied as an ASI-certified product.

HIGH-PURITY ALUMINA

In 2021, we announced a joint development project with FYI Resources Ltd. in Australia to investigate the production of high-purity alumina (HPA). HPA is characterized by high brightness, resistance to corrosion, and capacity to accommodate high temperatures. It is used in materials critical to the global energy transition, such as LED lighting that consumes less power and lasts longer, and lithium-ion batteries used in electric vehicles. [Learn more.](#)

Aluminum

Smelting alumina to produce molten aluminum is an energy-intensive process that emits greenhouse gases, even when using current best-available technology. We have had success in reducing our absolute energy usage and GHG emissions through technological and process improvements and the use of renewable energy. (See the [Climate Protection](#) section.)

Our global casthouse network produces a complete portfolio of primary aluminum products, including billet, foundry ingot, rolling slab, wire rod, powder, and high-purity and P1020 ingot. All of these shapes are available as EcoLum products and are produced with less than 4.0 metric tons of CO_{2e} for every metric ton of metal, including both direct and indirect emissions for bauxite mining, alumina refining, smelting and casting. This performance is approximately 3.5 times better than the industry average.

An increasing number of aluminum downstream companies from various end-use segments, such as automotive, packaging and electrical, are setting their own GHG emissions-reduction targets. These include net zero commitments and targets to reduce Scope 3 emissions from purchased raw materials. Public procurement projects, especially in Europe, are also increasingly looking at the environmental parameters of products and materials.



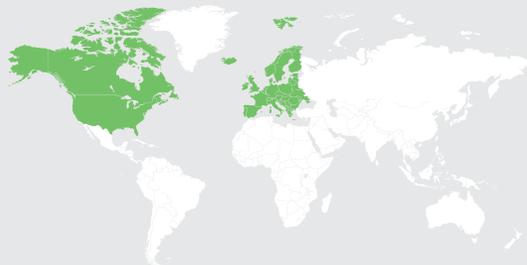
Global Aluminum Smelting Emissions

Average CO_{2e} emissions per metric ton of aluminum produced

EcoLum	4.0
World average	14.6

Source: Average data per CRU Aluminium Cost Model 2020 and CRU Bauxite and Alumina Cost Model 2020

Region of production (smelting)



In 2021, we began supplying EcoLum aluminum to WKW Extrusion's Erbslöh Aluminium for that company's new brand of low-carbon, semi-finished extrusion products. The products are designed with a specific focus on reducing carbon dioxide emissions for customers in the automotive, industrial, furniture accessories and consumer electronics industries.

"The carbon footprint of aluminum products attracts growing customer attention," said Norbert Sucke, Managing Director, Erbslöh Aluminium GmbH. "Erbslöh Aluminium GmbH is proud to convert Alcoa's EcoLum primary aluminum into billets and high-quality extrusions. Besides our inhouse activities, such as heat recovery, green energy consumption and scrap recycling, Ecolum enables the favorable carbon footprint of our NEWTRAL® aluminum products. It feels good to be part of a sustainable supply chain."

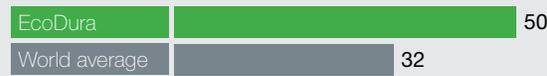
Aluminum made with low GHG emitting processes is a solution to achieve emissions targets, as metal often accounts for the majority of the carbon footprint in metal-intensive industries.

The environmental product declaration (EPD) covering the EcoLum family of cast products provides further information and validation of the products' total environmental footprint. Customers can use EcoLum EPD data for life cycle assessments of their own products to demonstrate a reduced carbon footprint compared to industry averages.

Our EcoDura high-quality aluminum, which is produced with at least 50-percent recycled metal, conserves significant amounts of energy and reduces the environmental impacts associated with producing virgin aluminum. It is an important enabler of the circular economy and contributor to sustainable building initiatives, including contributing points toward LEED and C2C certifications. EcoDura is available in billet and slab format.

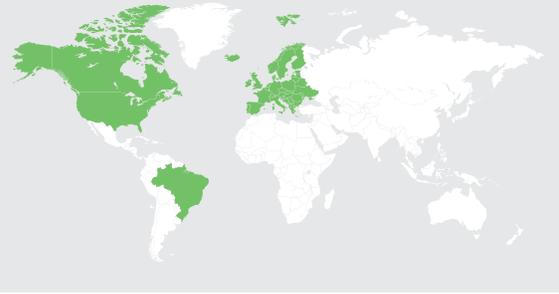
Average Recycled Content in Aluminum

Percent



Source: International Aluminium Institute, 2018

Region of production



While the aluminum industry has long been focused on recycling pre-consumer (industrial) scrap, the future will require new solutions to tackle increasing streams of post-consumer scrap. Alcoa is currently developing our ASTRAEA™ technology to address this challenge. (See the [Recycling](#) section.)

Alcoa Advanced Alloys

Another product family—Alcoa Advanced Alloys—provides environmental benefits while offering advanced mechanical or thermal properties for new light weighting solutions. This is especially crucial for the transition to cleaner electrified vehicles.

While battery electric vehicles (BEVs) currently make up approximately 7 percent of the global market, their share is expected to reach an estimated 37 percent by 2028. This is supported by increasingly strict government regulations and growing consumer demand for vehicles with a lower carbon footprint.

The transition to BEVs will be supported by several major countries, including Canada, France and the United Kingdom, which have announced bans on new internal combustion car sales between 2030 and 2040. In the United States, the state of California also has announced plans to ban sales of new gasoline powered cars starting in 2035, and the European Union is considering a similar ban.

Electric vehicles need to use more aluminum to compensate for heavy batteries. A 2019 [Ducker study](#) indicates that an electric car contains around 100 to 150 kilograms (220 to 331 pounds) more aluminum than a comparable model with an internal combustion engine. More of the lightweight metal is being used in the battery box as well as crush management systems and structural parts. Alcoa Specialty Alloys were designed for these and other automotive applications.

For example, complex structural components made with our EZCast™ C611 alloy often do not require additional heat treatment, as the target mechanical properties will be achieved after the car undergoes the normal painting process .

Suitable for shock towers and battery trays, our EZCast-NHT™ alloy demonstrates higher mechanical properties in an “as cast” state without any additional heat treatment. Avoiding separate heat treatment of cast parts reduces costs, simplifies operations, uses less energy and reduces GHG emissions.

Alcoa also produces SupraCast™, VersaCast™ and EverCast™ specialty alloys.

Case Study

Alcoa Advances Sustainably With Recycled Aluminum Produced Using Renewable Energy

Nestled between mountain and sea in northern Norway, our Mosjøen smelter now boasts a state-of-the-art recycling furnace that uses renewable energy to save energy and unlock the infinite recyclability of our metal.

Recycling aluminum saves approximately 95 percent of the energy that would be used to produce the metal from raw materials. The recycling furnace, which went online in 2021, runs on electricity sourced from wind and hydropower and uses alternating current that runs through a resisting coil.

Known as induction, the process creates heat that melts the aluminum, that is then blended with Alcoa's low-carbon metal and any alloying ingredients, based on customer specifications.

Most facilities melt scrap using natural gas burners on the walls and roofs, radiating heat toward the center. By using renewable power via induction, 4,400 metric tons of carbon dioxide emissions per year are avoided by not using a traditional furnace. That is the equivalent of taking about 1,000 cars with internal combustion engines off the road.

Mosjøen's recycling furnace involves a collaboration between Alcoa and [MMG Aluminium](#), a German-based metals trading company that supplies Mosjøen with clean aluminum scrap.

"We have been working with the plant in Mosjøen for more than 15 years, and we are happy to see our long and steady relationship grow with an increase in the site's recycling capabilities," said Guenter Strobel, the CEO and Founder of MMG Aluminium. "We see Alcoa as the right partner for this project, which combines green energy to power a new furnace with the high-end quality standard of the products that we get from Alcoa Mosjøen."



Recycling

7 AFFORDABLE AND CLEAN ENERGY



8 DECENT WORK AND ECONOMIC GROWTH



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



4 RISK MANAGEMENT



6 ENVIRONMENTAL PERFORMANCE



8 RESPONSIBLE PRODUCTION



Aluminum can be recycled infinitely without losing its properties, making it the sustainable choice in many of the markets we serve.

According to the [International Aluminium Institute's](#) analysis, approximately 75 percent of all primary aluminum ever produced is still in productive use. Producing primary aluminum from recycled content saves 95 percent of the energy required to make virgin aluminum, also reducing energy-related emissions.

Even though we are a primary aluminum producer, some of our casthouses use recycled aluminum, and, in our Sustana family of products, we offer EcoDura™ primary aluminum that contains at least 50 percent of recycled content. (See the [Products](#) section.)

Our major locations using scrap metal during 2021 were the Poços de Caldas smelter in Brazil and Mosjøen smelter in Norway, with several other sites consuming smaller amounts.

To ensure the quality of our final products, the recycled aluminum that we use is pre-consumer (industrial) scrap. We are not in the business of recycling post-consumer scrap, which typically requires different equipment.

Efficient recycling of post-consumer scrap poses a major challenge to the aluminum industry. In 2021, we announced that we are developing a process that can convert low-quality aluminum scrap to quality levels far exceeding the purity levels at commercial smelters, potentially tapping vast supplies of unused aluminum scrap. Called the Alcoa ASTRAEA™ process, this proprietary technology is one of the items in our future-oriented technology roadmap. [Learn more.](#)

In addition to recycling aluminum scrap, we actively seek to recycle or reuse our secondary materials, such as carbon, electrolytic bath, fly ash and secondary aluminas. Reducing landfilled waste is one of our strategic goals. See the [Strategic Long-term Goals](#) and [Waste](#) sections for additional information.

Our recycling efforts extend beyond our own operations to include partnerships with established recycling initiatives. In the United States, Alcoa Foundation continued to engage with [The Recycling Partnership](#) in 2021 through financial support and representation as a corporate partner. The organization uses public-private partnerships to improve residents' access to recycling at the local level.

Alcoa Foundation's commitment to The Recycling Partnership helped support numerous projects across the U.S. and the development of the [Paying It Forward](#) report. Published in 2021, the report examines both the investment necessary to improve the U.S. recycling system and the return on that investment.

With support from Alcoa Foundation, The Recycling Partnership expanded its reach to 1,058 U.S. communities in 2021, bringing its cumulative total to more than 3,103 communities. The organization's initiatives eliminated an estimated 187,420 metric tons of carbon dioxide, saved 171,000 cubic meters (53 million gallons) of water and collected more than 78,037 metric tons of recyclables during the year.

Shared Value Creation

1 NO POVERTY



3 GOOD HEALTH AND WELL-BEING



4 QUALITY EDUCATION



5 GENDER EQUALITY



6 CLEAN WATER AND SANITATION



8 DECENT WORK AND ECONOMIC GROWTH



10 REDUCED INEQUALITIES



17 PARTNERSHIPS FOR THE GOALS



9 SOCIAL PERFORMANCE



Our sustainability strategy includes a goal to create value for the communities where we operate, stimulating economic activity to improve the quality of life for our employees and neighbors.

We do this by providing stable, fair-paying jobs, procuring goods and services from local suppliers when possible, paying income and other taxes, and investing in community infrastructure and initiatives. The value we create helps communities thrive and earns us our social license to operate in these communities.

Guiding our value-creation efforts with local and regional stakeholders are our [Values, Ethics and Compliance Program](#), [Human Rights Policy](#) and Alcoa Stakeholder Engagement Framework. These are also the foundation of our efforts to provide our employees with the opportunity for a better quality of life and well-being, professional development opportunities and a safe work environment that is equitable, diverse and inclusive.

In 2021, we launched our comprehensive social performance management system (SPMS), called SP360, that we will implement across the business. SP360 will help us ensure that our policies and standards to support effective engagement with communities, manage our social risks and maintain our social license to operate are in place at all Alcoa-managed locations.

SP360 considers our unique portfolio of operations, our resources and our capacity while challenging us to keep pace with rapidly evolving international best practices and standards.

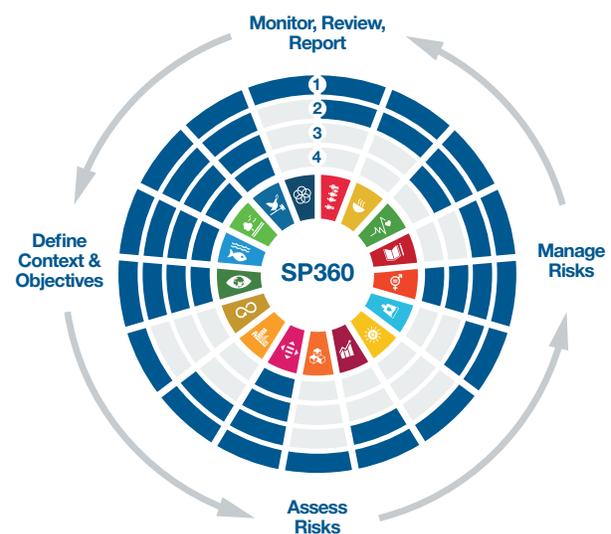
We are working to embed social performance into our core business processes. This means not only developing an Alcoa-specific approach but also working collaboratively with other departments and functions to integrate our social management standards into the relevant parts of our business and operations.

We intend to implement SP360 at all locations by the end of 2022, which includes defining performance metrics and long-term goals to be accomplished by 2025 and 2030.

SP360 aligns implementation of our SPMS to international best practices and maps the standard requirements to our sustainable development goals. It is designed to meet the expectations of both our neighboring communities and international organizations, such as ASI and ICMM.

SP360 is composed of four standards:

1. Social Performance Management
2. Indigenous and Land-Connected Peoples
3. Cultural Heritage Management
4. Human Rights Management



We created our Social Performance Management Unit (SPMU) to support the implementation and integration of our SPMS across the business. SPMU is responsible for developing and overseeing our SPMS, implementing the social management standards, and providing regional and location-specific support to locations and activities.

In agreement with the business, our social performance team has prioritized implementation of SP360 in our mining communities, specifically our operations in Western Australia and Juruti, Brazil. We will continue the system's rollout in 2022 to incorporate all other locations.

The work we are doing to implement our SPMS will define metrics and then measure progress in a range of socioeconomic indicators relevant to our interactions with host communities.

2021 Alcoa Economic Value

	Australia	Europe	North America	South America	Total
Labor Costs (US\$ billions)	0.5	0.2	0.8	0.1	1.6
Procurement Spend (US\$ billions)	2.0	2.6	4.6	1.2	10.4
Income Taxes (US\$ millions)	105.4	26.6	16.5	25.2	173.7

Labor costs include compensation and benefits for employee services rendered plus employee expenses for external training, transfer and relocation, expatriate costs, workers' compensation, travel, recognition and rewards, medical expenses, meals, recruitment, transportation, education, work clothes and other employee-related expenses. Income tax amounts are net of income tax refunds received and exclude various other taxes.

2021 Alcoa Foundation Investments

	Cash (Millions of U.S. dollars)	Employee Volunteer Hours
Australia	1.3	4,000
Europe and Africa	2.0	500
North America	1.6	300
South America	1.0	900
Global Outreach	1.3	0
Total	7.2	5,700

Alcoa Foundation does not make in-kind contributions. Management overhead in 2021 was US\$613,894. Although we increased our volunteer hours in 2021 compared to 2020, we did not yet reach pre-pandemic levels due to the remaining restrictions for interactions in different jurisdictions.

Additional details on our 2021 financial performance can be found in the [2021 Alcoa Annual Report](#).

Mineral Revenues

As a signatory to the [Extractive Industries Transparency Initiative](#) (EITI), we support enhancing the transparency of mineral revenues. We believe that engaging with governments that implement EITI's principles helps to ensure that mining revenues are used appropriately to address a host country's and host community's social needs.

We have four active bauxite mining areas in Australia and Brazil. Currently, Australia and Brazil are not EITI-implementing countries.

In Australia, we are a signatory to the government's Voluntary Tax Transparency Code, and we publicly disclose Alcoa of Australia's tax payments via an annual [tax transparency report](#). Because our operations in Western Australia are governed by a single mineral lease and substantially interconnected state agreements, they are regarded as a single project. The information in the chart below includes tax payments on all income and compensation (including refining, smelting and other activities) for all of our legal entities in Australia. We do not separately track or pay taxes on mining activities.

In Brazil, mining rights are granted through mining concessions by the Federal Government, through the Agência Nacional de Mineração (National Mining Agency) or the Ministério de Minas e Energia (Ministry of Mines and Energy). Each mining area is subject to a mining concession. The information in the chart below includes tax payments on all income and compensation (including refining and other activities) of Alcoa World Alumina Brasil Ltda. We do not separately track or pay taxes on mining activities.

Currently, we have three mining concessions granted to Alcoa World Alumina Brasil Ltda for bauxite mining in the Juruti region and 28 mining concessions granted to its subsidiary Companhia Geral de Minas for bauxite mining in the Poços de Caldas region.

Copies of our mining agreements and concessions are available on [Alcoa.com](#).

We also have minority interests in bauxite mining activities in Brazil, Guinea and Saudi Arabia, but those non-controlled joint ventures are not included in this report. Learn more on the [Alcoa section](#) of the EITI website.

2021 Payments

Millions of U.S. dollars

	Income Tax	Royalties	Fringe Benefits Tax	Payroll Tax
Australia				
Government of Australia	104.8	–	0.5	–
State of Western Australia	–	53.4	–	28.1
State of Victoria	–	–	–	0.9
Australia Total	104.8	53.4	0.5	28.9
Brazil	8.5	11.4		3.8

Goods and services tax and fuel tax credits paid/refunded (on a net basis) are not included in the Australia total.

Mining Partnerships for Development

Our locations and Alcoa Foundation partner with numerous non-governmental and community-based organizations on social, environmental and economic development activities in our host communities.

In 2021, we dedicated more than US\$500,000 to continue supporting our host communities' response to the COVID-19 pandemic while resuming activities linked to Alcoa Foundation's strategic themes:

- Contributing to biodiversity conservation through the support of initiatives focused on protection and restoration of high-impact areas
- Supporting research, mitigation and adaptation to climate change programs
- Contributing to the growth of our communities by expanding opportunities for equitable access to education and skills development

In the area of biodiversity conservation, Alcoa Foundation initiated a partnership with the International Union of the Conservation of Nature (IUCN) to evaluate the biodiversity, community impacts, and approaches of ecological restoration projects in two regions of the world with diverse landscapes and regulatory frameworks: Brazil and Iceland. The research will be used to develop guidelines and resources to increase the success of restoration efforts.

The foundation also entered into a partnership with the Organisation of Kaliña and Lokono in Marowijne (KLIM), which is an Indigenous Peoples association from our hosting communities in Suriname. The goal is to undertake environmental education and protection efforts to preserve the culture and history of eight Indigenous villages and, at the same time, develop nature tourism and an environmental education approach.

Although we are a minority partner in the Compagnie des bauxites de Guinée (CBG) mining company in Guinea, we take an active role in community engagement. In 2021, Alcoa Foundation extended its partnership with Earthworm Foundation to support the second round of a social training program for 20 Guinean professionals from diverse sectors, including industry, civil society, government and communities. The overall goal is to recruit, train and place social practitioners in mining regions so they are prepared to facilitate social processes and improve participatory development in the region. Earthworm Foundation will also pilot a community capacity-building short course in the Boké region.



We have a foundation in Brazil, Instituto Alcoa, that operates at the country level with objectives connected to public policies and agendas of global interest, including the United Nations Sustainable Development Goals.

The strategic priorities of Instituto Alcoa are:

- Promote initiatives in education and income generation, which are key areas for developing a fairer society
- Encourage social participation and dialogue to mobilize engagement
- Build a relationship of trust and generate partnerships with organizations

In 2021, Instituto Alcoa invested more than US\$700,000 in several programs and projects in the hosting communities of our three major operations in Brazil: Alumar, Poços de Caldas and Juruti.

We provide additional support to our host communities through corporate funding. For example, the Alcoa Sustainable Communities Funds in Canada invest C\$1 million each year for projects in the Baie-Comeau, Bécancour and Deschambault-Grondines/Portneuf regions of Québec. The unique governance structure of the Alcoa Sustainable Communities Funds fully engages the communities, and funded projects begin with ideas submitted through citizen forums. Each regional sustainable development committee prioritizes these ideas, which are implemented by citizens, municipalities and local organizations from each community. Since its creation in 2011, the fund has supported nearly 147 projects and invested approximately C\$10 million.

Taxes

In addition to the economic activity we stimulate at the local and regional levels, we also contribute to the communities in which we operate through a variety of tax payments.

APPROACH

Our tax professionals partner with our business professionals to provide proactive, efficient tax services in line with the following commitments:

- We will satisfy all income tax reporting and filing obligations in accordance with laws and regulations;
- We will develop and implement tax strategies to support business goals and maximize after-tax cash flows;
- We will mitigate tax risk through thoughtful implementation and documentation of commercial transactions and tax strategies and proactive involvement in legislation. Where possible, we will work closely with local governments to ensure transparency, and we will participate in current audit initiatives to shorten audit cycles and reduce tax risk;
- We will assist in developing sustainable, arms-length pricing on intercompany transactions;
- We will not develop tax structures or take tax return positions that are not at least more likely than not to be sustained on a tax audit;
- We will not engage in tax planning that relies on the non-disclosure of activity or of ownership in tax havens or secrecy jurisdictions; and
- We will closely follow our financial and ethical policies and guidelines.

We are committed to complying with the spirit as well as the letter of the tax laws and regulations in the jurisdictions in which we have a tax presence. We have a number of tax procedures to ensure our senior management understands the tax consequences of all material company transactions, audit settlements and other material tax matters globally.

Our tax strategy applies to all corporate taxes, including corporate income tax, value-added tax, sales tax and property tax.

GOVERNANCE, CONTROL AND RISK MANAGEMENT

Our Tax Policy is reviewed by the Audit Committee of the Alcoa Board of Directors and the Chief Financial Officer. At least once per year, the senior vice president of tax and members of our Tax Group evaluate the policy for any necessary changes. The senior vice president of tax is responsible for ensuring compliance with this policy and reports regularly to the Chief Financial Officer and Audit Committee.

Our tax personnel are involved in all major business restructurings and initiatives and ensure alignment with business-related sustainable development strategies. Any tax planning is reviewed by our heads of Finance, Tax, Treasury and Legal.

To manage tax risk, professionals working in our locations globally oversee our tax affairs. We provide these employees with the necessary training to ensure we meet our statutory tax obligations and have taken only sustainable positions that are consistent with our tax strategy. We also solicit the advice of external advisors when specialized technical expertise is required.

Our tax risks are updated quarterly and maintained in an enterprise risk management (ERM) software tool. We also update our tax and data software systems continuously to meet regulatory changes and increasing information requirements from government authorities.

Our Executive Team and Board of Directors have oversight of our tax risks as part of our ERM process, and we encourage members to identify and discuss tax risks and mitigation. (See the [Risk Management](#) section.)

All of our global tax offices participate in an annual self-assessment to ensure that our operations and processes are meeting the expectations of our documented standards, policies and practices, and legal and other requirements. Internal and external auditors regularly audit our tax compliance, controls and documentation processes, with the audited tax disclosures published in our [annual report](#).

STAKEHOLDER ENGAGEMENT

Our tax personnel strive to build and maintain effective working relationships with tax authorities, internal and external partners, governmental authorities and auditors.

All employees and external stakeholders can report tax concerns through our [Integrity Line](#) without fear of retaliation. (See the [Governance, Ethics and Compliance](#) section.)

We recognize that the taxes we pay help build the physical, social and educational infrastructure needed to support growth and development in the regions and countries where we operate. As such, we support fair and equitable tax structures that support business growth and incentivize innovation.

We engage with industry groups, international organizations and government authorities on regulatory changes and initiatives. We believe that transparent communication is critical to understanding the short- and long-term impact that tax rules and regulations may have on our industry, company and stakeholders.

Transfer of Knowledge and Best Practices

As a leader in sustainability, we continuously seek opportunities to assess and influence the sustainability efforts of our suppliers and partners. (See the [Supply Chain](#) section.)

We review and monitor the compliance programs of significant joint ventures where we are not the controlling shareholder or operator. 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 partners 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
- Ethics training, confidential reporting and investigations

Our teams work with our 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, we also share our policies, procedures and best practices with our partners.

We extended our human rights risk assessment to our non-controlled joint ventures in late 2019, requesting each to complete a questionnaire covering the main topics assessed. In 2020, we began working with specific joint ventures to address any identified gaps.

In 2021, we advanced our work with joint ventures focusing on our Guinean operations, where we own a minority equity position in CBG. We strengthened the governance structure to provide better support on sustainability-related matters, with a special focus on human rights due to an ongoing mediation process, managed by the [Compliance Advisor Ombudsman](#). See the [CBG website](#) for more information.

In addition to compliance and human rights, we take an active role in transferring our best practices in environment, health, safety and human resources to our non-controlled joint ventures. The level of involvement varies based on the maturity of processes and systems as well as the identified risks of each operation. Our involvement ranges from sharing our best practices and standards to temporarily assigning Alcoa experts to the joint venture. We also conduct risk assessments of various aspects of a joint venture when warranted.

In 2021, we encouraged our joint ventures to join the Aluminium Stewardship Initiative and focus on progressing toward international environmental, social and governance performance standards.

Supporting Community Skills Building Programs in Guinea

In the bauxite-rich regions of Guinea, 20 newly trained social practitioners will help companies, communities, governments and society plan for sustainable livelihoods and prevent conflict by ensuring bauxite production benefits the broadest range of stakeholders, with all working together transparently.

Guinea's mining regions lacked local individuals with the skills and knowledge necessary to engage with the mining companies on key development issues. This made it difficult to transform mining benefits into durable economic and social development for the local communities, which have significant demand for employment and basic services like electricity, water and healthcare.



To address this, Alcoa Foundation provided funding for the [Earthworm Foundation](#) to create the Social Training for Guinea Professionals program at the organization's Centre of Social Excellence in Cameroon.

The program's first cohort of 20 students came from mining companies, civil society organizations, state funding bodies, municipalities, government ministries and state training institutes. Each student undertook:

- Four months of classroom training on approximately 20 topics that were taught by world-class practitioners
- A 12-day field trip to the Boké region, the center of Guinea's mining-driven economic growth
- A six-month field project at one of 14 local organizations to address the key issues of company support—including jobs, compensation and investments—provided to impacted communities, conflict prevention and management, management of local economic development funds and restoration and rehabilitation of degraded sites
- One-month project write-up period and preparation for full-time work as a social practitioner

"Thanks to this training, we had a common vision of natural resource management, which is extremely important," said Diallo Mamadou Oury, a member of the first cohort that finished the program in late 2021. "The communities had not been involved in natural resource management at all. But this training allowed us to understand that communities must be involved in the whole value chain. It also gave us the tools for the effective implementation of natural resource management in our country."

Alcoa Foundation has funded a second round of training for 20 students that will begin in 2022. Earthworm Foundation also will use a portion of the funding to pilot a 10-day capacity-building course for community members and to advance the establishment of a Centre of Social Excellence in Guinea.

Stakeholder and Community Engagement

17 PARTNERSHIPS FOR THE GOALS





We work to maintain transparent and regular communications with our stakeholders to ensure a mutual understanding of issues, concerns and opportunities.

We define a stakeholder as any person or organization that directly impacts, or is impacted by, our activities. This includes stockholders, employees, customers, suppliers, government representatives and regulators, non-governmental organizations, local communities and the media.

Our stakeholder relationships are both formal and informal. With customers, suppliers, governments, employees and stockholders, we typically have formalized, contractual or even legally mandated channels for engagement. Our interaction with other stakeholders is typically less formalized but still requires deliberate attention on a regular basis.

Our locations use the Alcoa Stakeholder Engagement Framework to manage risks and opportunities associated with community rights and interests, as well as to obtain feedback from the communities where we operate. The framework provides a systematic process to ensure active interaction with our stakeholders to achieve mutual success.

As part of this framework, we gain an understanding of key community interests and priorities. Examples include:

- **Economic:** Employment opportunities, fair wages and infrastructure development
- **Environment:** Access to water, local air quality and waste management
- **Social and cultural:** Education, healthcare and protection of sacred places

To incorporate community rights and interests in our everyday activities in a systematic manner, we published the [Alcoa Social Policy](#) and updated our [Indigenous Peoples Statement](#) to an Indigenous Peoples Policy in early 2021 to enhance our commitment to this particular minority group.

In 2022, we will continue the deployment of those policies through the implementation of SP360, which is our newly defined approach to social performance. SP360 is our management system, covering social performance, human rights, Indigenous and Land-Connected Peoples, and cultural heritage management.

Our activities are focused on minimizing or avoiding adverse impacts and creating an environment where stakeholders who are directly or indirectly affected by our operations can benefit. (See the [Shared Value Creation](#) section).

Our social performance is also guided by the [ASI Performance Standard](#), which was developed by a multi-stakeholder group with broad representation of civil society and incorporates the practices of the [ICMM 10 Principles](#) and key [International Financial Corporation Performance Standards](#). At the end of 2021, we had 15 operating locations certified to the ASI Performance Standard. We intend to certify more of our operating locations in 2022.

Our locations are encouraged to form community consultation forums comprising a relevant cross-section of local stakeholders. These forums provide an opportunity for regular two-way communication between Alcoa representatives and community members on topics of mutual interest.

We also engage with stakeholders, primarily local communities and non-governmental organizations, through Alcoa Foundation globally and Instituto Alcoa in Brazil for social investment. The method of engagement varies by location. Some locations use community consultation forums, while others consult directly with employees, local leaders, institutions or regional associations. The aim is to understand stakeholder needs and contribute to the social, economic and institutional development of our host communities.

In 2021, we continued to support our host communities in their recovery from the pandemic. We focused our efforts on supporting local organizations that were providing critical services to address the most pressing issues in each community. These included continued supply of medical

and personal protective equipment, mental health and economic counseling for impacted families and resources to support virtual learning. Our stakeholder engagement helped us identify the key players and their needs quickly and then react rapidly to navigate through the crisis.

In Brazil, we conduct periodic Alcoa and Community Panels to monitor the impact of community projects supported by Alcoa Foundation and Instituto Alcoa. In addition, periodic surveys in Brazil and Australia help us better understand the perceptions and expectations of host communities and key stakeholders.

In 2021, we engaged a third party to conduct a community perception survey for our Western Australian bauxite and alumina operations. Approximately 800 community members were randomly surveyed across five geographic areas aligned to our operating locations plus the nearby state capital city of Perth. The survey followed similar work conducted in 2019.

The research suggested that while we have a strong reputation and social license in Western Australia, community and stakeholder expectations for the extractives sector are evolving, both locally and globally. This includes increasing community concerns about impacts on the environment and nearby communities and competing land uses.

Stakeholder engagement is also a key part of our human rights due diligence process, where individuals are given the opportunity to provide input on their relationship with the company and the functioning of established grievance mechanisms. Any stakeholder can raise issues or lodge a grievance using our confidential [Integrity Line](#). (See the [Governance, Ethics and Compliance](#) section.)

The following key issues were raised by, or discussed with, stakeholders in 2021.

2021 Stakeholder Issues

Location	Issue	Action
Anglesea, Victoria, Australia	<p>Filling a mine void with water is a key enabler to finalize the Anglesea Mine Rehabilitation and Closure Plan.</p> <p>In May 2021, we commenced a 12-month pumping test to investigate the use of groundwater to support the long-term filling strategy.</p> <p>Test outcomes will determine if a sustainable extraction rate can be established and will inform decisions about potential groundwater use in the longer term.</p> <p>The test is underpinned by a comprehensive monitoring plan, with a high level of oversight by a co-regulator technical working group.</p>	<p>Consultation with stakeholders remains a priority in the development and approval process for the mine's rehabilitation and closure. The water-filling strategy has been a key topic for several years through our community engagement activities.</p> <p>Since the pumping test commenced, we have regularly liaised via the co-regulator technical working group's monthly meeting and have kept the community informed through monthly updates. Reports are publicly available.</p>
Kwinana, Western Australia	<p>Since the Western Australian Planning Commission (WAPC) adopted the Kwinana air-quality buffer in September 2010, there has been litigation and questions on the legitimacy of the buffer and land uses in the area, particularly in Mandogalup.</p> <p>In 2019, the Minister for Planning announced the IP47 improvement plan for the Mandogalup area. The COVID-19 pandemic substantially delayed progress.</p> <p>In December 2021, the IP47 improvement plan was released for public consultation.</p> <p>We continued efforts to optimize our residue footprint, including through residue filtration technology. Filtration throughput significantly improved during 2021.</p>	<p>We support compatible development in the Mandogalup area with adequate separation between industry and residential development.</p> <p>During 2021, we continued routine engagement with regulators and will continue to participate in the IP47 process in 2022.</p> <p>We held a community consultation session in July 2021 to advise interested community members of the reintroduction of regular residue solar drying in the most eastern part of our residue storage area (known as Area F) while we continue to improve capacity of our filtration technology.</p>

2021 Stakeholder Issues

Location	Issue	Action
<p>Pinjarra and Huntly, Western Australia</p>	<p>To keep adding value to Western Australia and to meet contemporary expectations, we are seeking to modernize the environmental approvals for our Pinjarra alumina refinery and Huntly bauxite mine.</p> <p>In 2020, we submitted the following plans for environmental assessment:</p> <ul style="list-style-type: none"> • Increase alumina production at our Pinjarra refinery by 5 percent from 5 million metric tons per annum (MTPA) to 5.25 MTPAa • Transition the Huntly mine into the Myara North and Holyoake regions • Increase the mining rate to supply up to 2.5 MTPA of bauxite for export <p>These plans are being assessed under the State Environmental Protection Act 1986 and the Federal Environmental Protection Biodiversity Conservation Act 1999.</p>	<p>Environmental studies, preparing the environmental review document and stakeholder engagement were the focus of our work in 2021.</p> <p>As of the end of 2021, we engaged with around 1,700 community members and interested stakeholders on our proposal. This included sharing our plans with more than 130 diverse groups representing environmental, tourism, heritage, government and business stakeholders.</p> <p>This process has helped us understand the values important to our stakeholders and how we can continue to successfully coexist in the jarrah forest alongside other land uses.</p> <p>Additional information about the environmental assessment is available on alcoa.com.</p>
<p>Portland, Victoria, Australia</p>	<p>Portland Aluminium conducted a health assessment program of the koala population in the smelter's blue gum plantation in September 2020. The assessment aimed to provide information about the large number of koalas inhabiting the area.</p> <p>It was prompted by a koala count conducted in May 2020 that indicated 170 koalas were inhabiting the smelter's 17-hectare (42-acre) blue gum plantation area.</p> <p>Information provided by the Department of Environment Land Water and Planning (DELWP) indicated that the population would continue to grow and over-browsing often can impact koala health where koala densities exceed one per hectare.</p> <p>Questions were raised about an injured koala found at the Portland Golf Club and potential links to the smelter.</p>	<p>We engaged independent consultant Ecoplan Australia to undertake a second health assessment of koalas inhabiting the smelter parklands in August 2021.</p> <p>The DELWP-approved activity included fertility control and considered options for relocation and managing disease.</p> <p>Information collected during the assessment has increased our understanding of the koala population and is being used to inform future management approaches and our Koala Management Plan.</p> <p>Community members and interested stakeholders, including media, were informed of the health assessment and short-term goals to address koala health concerns, as well as other actions completed in 2021. These include refresher training for key employees responsible for handling and relocating koalas and the modification of fencing around the smelter to prevent koala access.</p> <p>Investigations conducted by the regulator into the cause of the koala's injuries were inconclusive relative to being sustained at the smelter.</p>

2021 Stakeholder Issues

Location	Issue	Action
Portland, Victoria, Australia	<p>On behalf of our Portland Aluminium joint venture partners, we sought an internationally competitive energy contract to help secure a sustainable future for the smelter beyond contracts that expired in July 2021.</p>	<p>In March 2021, we announced new five-year agreements with multiple power generators (AGL, Alinta Energy and Origin) that commenced August 1, 2021. Contributions were also made by the federal and Victorian state governments in recognition of the role the smelter plays in supporting grid stability and the broader economy.</p> <p>In the lead-up to and following the supply announcement, we also engaged with stakeholders that included joint venture partners, federal, state and local governments, business partners, employees, union representatives and media.</p> <p>We also worked across the year in support of a potential offshore windfarm proposed by Alinta Energy that was announced in December 2021. The windfarm could supply the smelter and east coast grid. We are involved in supporting the early phase investigations. The project is aligned with our global commitment to derive more electricity from renewable sources. More information is available on the project website.</p>
Wagerup, Western Australia	<p>A significant loss of process material from a refinery tank occurred in March 2021, with the material exiting the vessel captured within the refinery footprint.</p> <p>No employees were in the immediate vicinity at the time of the incident, and the area was promptly isolated to ensure employee safety.</p>	<p>We acted immediately to commence clean-up of the site. We advised the Department of Mines Industry Regulation and Safety and the Department of Water Environmental Regulation of the incident, and an investigation into the cause occurred.</p> <p>Significant media interest saw reporting in local, state and national news channels.</p> <p>We continue to work closely with the Department of Mines Industry Regulation and Safety and the Department of Water and Environmental Regulation in relation to the incident.</p>

2021 Stakeholder Issues

Location	Issue	Action
Juruti, Brazil	<p>Since 2018, the Federal Public Prosecution of Santarém and the Federal Court of Santarém prohibited Alcoa from carrying out any mining and community relations activities in the Lago Grande region in Santarém. We have not conducted any exploration activity in the area since 2008, and we suspended community relations activities in 2018.</p>	<p>In 2020, we submitted a proposal for consultation based on ILO 169 to the Federal Public Prosecution to restart engagement with the region's communities to reach an agreement with them.</p> <p>We did not receive approval to restart engagement in 2020 due to the pandemic. We reiterated our request in early 2021, and the government is evaluating the possibility of mediating the community consultation.</p>
Juruti, Brazil	<p>In December 2020 and February 2021, our Juruti operations in Brazil experienced three minor environmental incidents connected to a significant increase in rainwater during the wet season. Soil erosion caused turbidity in a drinking water source for the community of Jauari and a fishing area for the community of Capiranga.</p>	<p>Each situation was back to normal in 10 to 15 days, and we provided food, drinking water and financial compensation to those who were impacted.</p> <p>In 2021, we signed an agreement with each of the communities to perform a technical study on the socioeconomic and environmental impacts from the incidents. We also agreed to continue providing financial compensation, food and drinking water to the affected communities until the amount of financial compensation is determined by the independent study, which was completed at the beginning of 2022.</p> <p>SEMAS, the state environmental agency, suspended Juruti's mining license at the end of March 2021 for the mine's six active areas while the agency opened an investigation to get assurance that the situation was under control and no additional incidents would occur. We signed an agreement with the communities in late 2021, and all suspensions were revoked.</p>
Juruti, Brazil	<p>In October 2019, the Association of Communities of the Juruti Velho Region (ACORJUVE) issued a letter preventing Alcoa from developing social activities in Juruti Velho and surrounding communities. This followed ACORJUVE's decision to not follow an agreed-upon path to create a foundation to manage the royalties that we pay to ACORJUVE to ensure transparency and good governance.</p>	<p>An executive group formed by Alcoa, ACORJUVE and the National Institute of Colonization and Agrarian Reform (INCRA) was reinstated in 2021 to proceed with the valuation of losses and damages that will define the compensation paid to the communities. In July 2021, ACORJUVE presented its proposed statute for the creation of the foundation, and we will work with both parties to quickly complete the foundation's formation.</p> <p>In December 2021, Alcoa and ACORJUVE signed a Protocol of Intent with the general purpose of improving bilateral relationships and trust. The aim is to build mutual respect, transparency and good faith and define common understanding and intentions.</p>

2021 Stakeholder Issues

Location	Issue	Action
Juruti, Brazil	<p>In November 2019, families with no title to the land in an area inside the Curumucuri Settlement in Juruti, Brazil, blocked Alcoa exploration activities that had already been authorized by Acoglec, which is the local community association and legal holder of the land's title.</p>	<p>After several negotiation sessions involving Alcoa, Acoglec and Iterpa (the state land authority) in 2020, no formal agreement was established on the relocation of the families.</p> <p>In 2021, we decided to start negotiations directly with Acoglec to resolve the issue. Through Acoglec, we reached a positive agreement with most of the families. We expect this dispute to be resolved in 2022, but influx management continues to be a critical risk to address in the Juruti area of influence.</p>
Juruti, Brazil	<p>The Prudente community was concerned that one of its access roads would be blocked because of its location near our new authorized mining area. The community asked for support to build an alternative road.</p>	<p>In 2021, we conducted a flora and fauna study that was required for the new road's environmental license. Construction is expected to begin in 2022.</p>
Fjarðaál, Iceland	<p>Due to a very hot and dry summer in East Iceland in 2021, the fluoride level in the grass in the fjord where our smelter is located was higher than the reference limit. This triggered additional monitoring to ensure the safety of the animals that feed upon the grass during the summer.</p>	<p>Each year, a veterinarian examines the animals that live in the fjord. No issues due to fluoride have been found.</p> <p>Fluoride can only affect an animal's bone health if fluoride levels are above the limit over the long term. It has no impact on the meat of the animals.</p> <p>Once the issue was identified, we worked closely with the farmers and regulatory authorities. We continue to monitor the situation in cooperation with these stakeholders.</p>

2021 Stakeholder Issues

Location	Issue	Action
Norway	<p>In April 2020, the Norwegian Sámi Association contacted us regarding our power purchase agreement with Øyfjellet Wind Farm. Parts of the wind farm are built in a trekking route that reindeer herds have traditionally used to get to a winter grazing area. It was alleged that through our energy supply agreement with the project developer, we enabled a project that impeded traditional livelihoods of the Sámi people and therefore violated our Ethics and Compliance Framework.</p> <p>The local Jillien-Njaarke Reindeer District subsequently filed a motion to halt construction of the wind-power project on grounds that it illegally closed off reindeer trekking routes. Both the Civil Court and the Court of Appeals rejected this claim.</p> <p>In November 2021, several reindeer districts and Samerådet, which is an NGO for Sámi affairs, sent a communication to the UN special rapporteur on indigenous peoples matters concerning the Øyfjellet project.</p>	<p>With the support of external experts, we conducted a thorough review of the project and the actions taken by the project developer. We concluded that the development's impacts had been thoroughly considered. The verdicts from the Civil Court and Court of Appeals supported the findings of our external review. In late 2020, the project developer and Jillien-Njaarke Reindeer District signed an agreement for the winter of 2020/2021. This was a step toward a permanent agreement between the parties after the wind farm becomes fully operational. In October 2021, the Norwegian Supreme Court's Grand Chamber ruled that two of the licenses related to another project—the Fosen Wind Power Project—constitute a violation of the Sami people's rights per the United Nation's International Covenant on Civil and Political Rights (ICCPR) Article 27. The Fosen Wind Power Project is a 1,000-megawatt onshore wind power project being developed in Trøndelag County in central Norway. As part of a development of six windfarms, it is considered to be the largest onshore wind power project in Europe. Immediately after the Fosen ruling was published, Alcoa Norway received a letter from Friends of the Earth Norway and a member of the Jillien-Njaarke Reindeer District asking us to terminate our power purchase agreement with Øyfjellet Wind Farm. The letter's authors extrapolated that the agreement was also in violation with ICCPR. Our internal legal review concludes that the arguments applied in the Supreme Court's ruling on Fosen are not attributable to Øyfjellet.</p>

2021 Stakeholder Issues

Location	Issue	Action
San Ciprián, Spain	Smelter and refinery employees commenced strike action in October 2020 as a result of our announcement to curtail production at the smelter.	<p>In January 2021, we reached an agreement with worker representatives to suspend the strike on the condition that we would conduct a sale process to SEPI, which is an entity of the Spanish national government. The government finally ruled out the possible sale to SEPI and Alcoa's position was that an energy solution is required before contemplating any sale to a third party other than SEPI. In September 2021, with the site not sold, the strike resumed.</p> <p>In December 2021, we reached agreement with the workers' representatives that will help resolve the challenges with Spain's exorbitant energy prices as well as to promote the future viability of the plant and the protection of employment. As a result of this agreement, the smelter's 228,000 metric tons of annual capacity has been curtailed for two years with the commitment to begin its restart in January 2024 and accomplish full restart by June 30, 2024. The anode plant has also been stopped during those two years while the casthouse will continue to operate to guarantee the supply of metal to customers.</p> <p>During the curtailment period, we will seek to secure long-term power purchase agreements beginning in 2024. Additionally, we have committed US\$68 million for capital investments and US\$35 million for restart costs. As part of the agreement, workers stopped the strike that affected both the aluminum smelter and alumina refinery. Employees will maintain full wages and benefits. The Company also commits not to start any collective dismissal nor temporary adjustment process before December 31, 2025.</p>
Massena, New York, USA	On September 21, 2021, during the normal course of demolition at our closed Massena East facility, a firewatch (person tasked with watching for fires) observed a smoldering fiber glass louver within the steel structure that was in the process of being demolished. Firewatch procedures were immediately implemented, and the Massena fire department was called in to provide assistance. The fiberglass component was removed from the structure and then soaked with foam to prevent any reignition. The incident concluded with no injuries or environmental or property damage.	<p>Although no notification to the community was required due to the specific nature of this incident, we communicated with external stakeholders.</p> <p>We made improvements to our response communication plan to ensure all local stakeholders, including the Saint Regis Mohawk Tribe, are aware of potential incidents that could impact them and the neighboring community in the future.</p>

2021 Stakeholder Issues

Location	Issue	Action
Badin, North Carolina, USA	<p>Members of the West Badin and Badin Lake communities allege Badin Business Park is discharging pollutants from the former Alcoa smelter site into Badin Lake.</p> <p>This allegation is not accurate; however, the facility does experience periods of noncompliance with a water permit limit for fluoride at a different outfall, which discharges to Little Mountain Creek.</p>	<p>We met with, and will continue to meet with, broader groups of community stakeholders to ensure that the community is informed and educated on the science of discharges from the site.</p> <p>We have created a website where we are posting sampling results and other updates on activities at Badin Business Park, which is an Alcoa subsidiary.</p> <p>Badin Business Park has a permit that regulates groundwater and stormwater discharges at 11 outfalls, or drainage areas, near the former plant site. Monitoring shows widespread compliance with daily and monthly limits established by the permit. These discharges do not pose any harm to the health of the people, the lake or the surrounding environment.</p>
Wenatchee, Washington, USA	<p>In December 2021, we announced the closure of the Wenatchee Works aluminum smelter, which had been fully idled (curtailed) since 2015. The site employed 18 people.</p>	<p>Some of the current employees will remain to assist with demolition and redevelopment work. We also engaged with the local stakeholder group and government officials to keep them informed throughout the process.</p>

NON-GOVERNMENTAL ORGANIZATION ENGAGEMENT

Non-governmental organizations provide significant value to society. We partner with these institutions to offer support and advance their work on items that have been identified as important to our stakeholders.

We historically have focused on two areas —preventing climate change and preserving biodiversity in the communities in which we operate. In 2020, we expanded our focus to include training and workforce development. We believe both are fundamental for developing the communities where we operate and ensuring access to future talent.

Examples of recent partnerships can be found throughout this report and on the [Alcoa Foundation website](#).

Memberships

The following are some of the organizations in which we are a member or participant:

[Aluminium Association of Canada](#)

[Aluminium Stewardship Initiative](#)

[Australian Aluminium Council](#)

[Brazilian Aluminum Association](#)

[Brazilian Council for Sustainable Development](#)

[Center for Climate and Energy Solutions](#)

[Eurometaux](#)

[European Aluminium](#)

[Extractives Industry Transparency Initiative](#)

[Icelandic Aluminium Association \(Samál\)](#)

[International Aluminium Institute](#)

[International Council on Mining & Metals](#)

[National Association of Manufacturers](#)

[The Aluminum Association](#)

[United Nations Global Compact](#)

Through these organizations, we engage with numerous stakeholders on issues important to the aluminum and mining industries.



Planting day in the Wagerup area of Western Australia as part of BirdLife WA's Alcoa Community Black-Cockatoo Recovery Project, supported by the Alcoa Foundation.

Sweet Introduction to World of Work

Socially and economically vulnerable youth looking to enter the job market in the Brazilian state of Maranhão have a sweet option.

Funded by Instituto Alcoa, the My Opportunity to the World of Work program aims to train and qualify 250 young people in the bakery specialties of sweets, savory foods and confections. There is no cost to the participants, who are selected by program administrator Maranhense Institute for Assistance and Social Inclusion.



Program graduates and staff

The program encompasses 12 bakery classes over 80 hours. Participants are also introduced to human relations, communication, ethics, human rights and entrepreneurship. In addition, Instituto Maranhense for Assistance and Social Inclusion offers a workshop on organizational and financial management planning for those who intend to open their own business as well as improvement workshops and job placement assistance.

At the end of 2021, 110 people had completed the program. Of these, 15 were already in the job market or had started their own business.

“This was an opportunity to acquire qualifications and have my own cake and confectionery business,” said program participant Rosenilde Costa Carvalho. “I am very happy to have participated in this program, which is already contributing to the generation of income for my family. I am offering cakes and am thinking about expanding my venture into the confectionery area.”



Human Rights

5 GENDER EQUALITY



8 DECENT WORK AND ECONOMIC GROWTH



10 REDUCED INEQUALITIES



16 PEACE, JUSTICE AND STRONG INSTITUTIONS



3 HUMAN RIGHTS



Respect for human rights and the interests, cultures, customs and values of employees and communities is embedded in our Alcoa Values.

Our commitment to support the [United Nations Guiding Principles for Business and Human Rights](#) and the [International Labour Organization Core Conventions](#) is incorporated into our [Human Rights Policy](#). We strive to ensure this commitment is exemplified by our actions and from our employees, suppliers and business partners. If we become aware of any potential violations to our policy, we act quickly and decisively.

Our Human Rights Policy operates in conjunction with the following:

- [Alcoa Code of Conduct](#) and employee training, both of which cover human rights
- [Indigenous Peoples Policy](#)
- [Social Policy](#)
- [Supplier Standards](#), which explicitly indicate respect of human rights
- Internal and third-party supplier assessment programs for new and existing suppliers (see the [Supply Chain](#) section)
- [Equal Employment Opportunity Policy](#)
- [Harassment and Bullying Free Workplace Policy](#)
- [Integrity Line](#) for employees, suppliers and the general public to report potential violations or concerns

The Alcoa Human Rights Council is sponsored at the executive level of Alcoa and includes representatives from each key resource unit and each region where we have operations. The council meets monthly and provides feedback to the sponsors twice a year to keep our Executive Team informed on human rights activities.

In 2021, the council focused its efforts on developing our Human Rights Management Standard to operationalize the Human Rights Policy and define clear roles and responsibilities for different layers of the organization. We updated the council's charter to reflect its ownership of the policy and new standard as well as the responsibility to oversee the standard's implementation.

To have a structured approach to deploy the standard, the council developed a three-year implementation plan. The plan ensures that the right level of due diligence is applied across all company functions and external interactions.

Over the last three years, we conducted human rights impact assessments (HRIAs) at 17 of the 19 locations we operate worldwide.

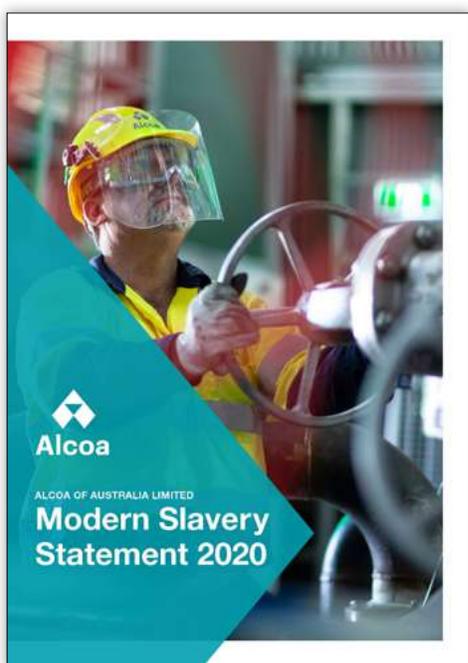
In 2021, we completed HRIAs at our Bécancour and Deschambault smelters in Canada and our Massena smelter in the United States. The results did not show any areas of very high concern but did identify a few opportunities for improvement related to deployment of systems to perform onsite human rights audits of supplier operations. We formulated an action plan to ensure that our internal systems are strong to prevent any human rights abuses in those operations and their supply chains. Additional information on how we are improving our auditing process for supplier human rights can be found in the [Supply Chain](#) section.

We previously completed more detailed HRIAs at our Western Australia sites due to their significant contributions to Alcoa's performance. Our Australian Human Rights Working Group has developed actions to work on those areas with a higher residual risk, particularly those related to Indigenous Peoples, and is progressing to close the identified gaps at our Western Australian locations.

In Brazil, each of our locations identified human rights impacts, created an action plan and took action. For instance, we deployed emergency response plans for dam failures to community stakeholders and improved the controls on the working conditions of contractors.

We have addressed the identified risks and impacts for all of our locations in an action plan that is overseen by the Alcoa Human Rights Council. Progress is reported to executive-level management on a periodic basis.

In 2021, Alcoa of Australia delivered its first [Modern Slavery Statement](#) in accordance with the reporting requirements of Australia's Modern Slavery Act, which aims to combat modern slavery in global supply chains. In accordance with the Act, companies are required to detail their actions to assess and address risks of modern slavery in operations and supply chains. Alcoa of Australia identified no incidents of modern slavery during the reporting period.



[Download the Modern Slavery Statement 2020](#)

Security can be one of the highest risks to human rights, as our host communities and employees may interface with private and public security providers who are in charge of local protection. We have no operations in areas of active conflict.

To ensure we respect human rights of all people in this space, we have a security standard that is incorporated in our contracts with private providers. We also applied to join the [Voluntary Principles on Security and Human Rights](#) in 2021 and received confirmation of acceptance in March 2022. In the meantime, we continue to further enhance our human rights practices through the implementation of our Human Rights Standard.

During 2021, we recognized Human Rights Day with internal communications to raise awareness among our employees.

Indigenous Peoples

We recognize and respect the diversity, cultures, customs and values of Indigenous and other Land-Connected Peoples where we operate, and we acknowledge their needs, concerns and aspirations regarding their heritage and traditions. We acknowledge that some of our operations are located in the homelands of Indigenous and Land-Connected Peoples and that, over the long history of our operations and through generations representing varying and increasing levels of cultural awareness, we have affected the rights and lives of those people in ways we might not fully appreciate or understand.

In 2020, we reflected on our approach to Indigenous and Land-Connected Peoples and updated our Indigenous Peoples Statement to an Indigenous Peoples Policy to demonstrate our company-wide commitment to these efforts.

As part of our work to fully implement a social management system at all locations by the end of 2022, we have developed the following global standards for engaging with Indigenous and Land-Connected Peoples and managing cultural heritage:

- **Indigenous and Land-Connected Peoples Standard:**
This standard requires locations to identify Indigenous and Land-Connected Peoples, undertake a fit-for-purpose social and economic baseline assessment, and create a culturally appropriate engagement plan. Other requirements include demonstrating free, prior and informed consent and shared value creation.
- **Cultural Heritage Management Standard:**
Our standard on cultural heritage management requires locations to identify cultural heritage values and potential impacts and risks with communities, develop a cultural heritage management plan and ensure the community can access places of significance so traditions can be maintained.

These standards will drive consistency in our approach across our operations, strengthen our practices to work more constructively with Indigenous and Land-Connected Peoples, and ensure that we align with ICMC's [Indigenous Peoples and Mining Statement](#).

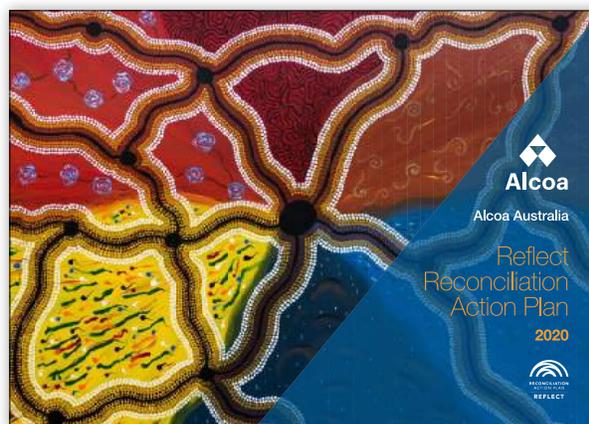
In line with our Care for People value, we have committed to honest and respectful engagement with Indigenous and Land-Connected Peoples near our operations to seek mutually advantageous outcomes. We are also committed to acting in accordance with all applicable laws and regulations, the principle of free, prior and informed consent, and other tenets of the International Labour Organisation's [Indigenous and Tribal Peoples Convention](#) and the [United Nations Declaration on the Rights of Indigenous Peoples](#) (UNDRIP). Wherever possible, we will seek to establish support for new activities from affected indigenous communities through collaborative accommodation of each other's interests and formal agreements.

Our locations with the most direct impact on Indigenous and Land-Connected Peoples are our operations in Australia, our Juruti mine in Brazil, and our former mining and refining operations in Suriname. Alcoa-managed bauxite mines in Juruti and Western Australia are located on lands of significance to Indigenous or Traditional Communities.

AUSTRALIA

Since 2019, we have taken steps to increase the reach and frequency of our engagement with local Aboriginal communities in the areas of influence of our Australian operations.

In 2020, we launched our inaugural Reflect Reconciliation Action Plan to guide us toward a more coordinated, deliberate and meaningful approach to reconciliation. In 2021, we continued that journey and consulted with local Aboriginal organizations and community groups to develop our second Reconciliation Action Plan (RAP). Focus areas for the RAP, which is at the second of four RAP levels (reflect, innovate, stretch and elevate), are cultural awareness training for all of our employees and economic opportunities through employment and purchasing agreements with Aboriginal-owned businesses. We expect to launch the "innovate" RAP in early 2022.



[Download the Reflect RAP](#)

Other actions we took in Australia in 2021 included:

- Working on building our social and economic knowledge base in Western Australia, with the aim to understand key socio-economic indicators to guide our community engagement activities and social investment program
- Recruiting an Aboriginal engagement lead to help build our capacity for respectful, inclusive and constructive engagement with local Aboriginal communities
- Entering into heritage agreements with the local land council for new major projects associated with our mines and refineries to ensure a collaborative approach to Aboriginal cultural heritage surveys on Noongar country
- Celebrating Aboriginal culture through NAIDOC Week events at all Australian locations. Activities included Welcome to Country and smoking ceremonies, flag raising, engagement with local Elders, and traditional dance performances and foods.
- Renaming our regional office in southwestern Western Australia to the Alcoa Bindjareb Regional Office in recognition of local history and as a mark of respect to the Traditional Owners: the Bindjareb People of the Noongar Nation
- Supporting new and expanding Aboriginal businesses and entrepreneurs through a partnership between the Alcoa Foundation and Wirrpanda Foundation to deliver nine business pop-ups that offer coaching and mentoring for businesses in areas where we operate



During a celebration of NAIDOC Week in Australia at our Pinjarra location, a cultural performance by local Aboriginal dancers the Bindjareb Middars included one dance signifying the coming together of Alcoa and the Bindjareb people.

We are committed to fostering respect, building relationships and sharing the benefits of our operations with local Aboriginal communities in Australia in order to achieve tangible, positive outcomes for both our host communities and our business.

JURUTI, BRAZIL

We have engaged with the traditional community of Juruti Velho, located at Vila Muirapinima, since the inception of the mine, which is located in the Amazon. Juruti Velho has a population of approximately 9,900 people (21 percent of the overall population of the municipality of Juruti) and encompasses 56 settlements located near the site where we started mining bauxite ore in 2009.

Alcoa, the National Institute of Colonization and Agrarian Reform (INCRA) and the Association of Communities of the Juruti Velho Region (ACORJUVE) have an established negotiation process on land use for mining and community. ACORJUVE is the formal organization that represents the Juruti Velho community, including landowner rights. The Brazilian federal and state governments also have participated in the negotiations.

In February 2018, ACORJUVE, INCRA, federal and state prosecutors and Alcoa signed a social, environmental and economic agreement on common land use, shared value and sustainable mining in the Amazon region. This followed a comprehensive study to evaluate compensation for loss and damages that was completed in late 2014.

The agreement included a payment of US\$5.3 million in compensation for the 2006 to 2010 period. The parties agreed that this amount and the royalties paid to ACORJUVE would be managed by a foundation to ensure transparency and good governance in accordance with recommendations issued in February 2015 by federal and state prosecutors.



Planting day at Lowlands in Western Australia's Peel region as part of the Peel-Harvey Catchment Council's Healing Bilya Project for the Serpentine and Murray rivers, supported by the Alcoa Foundation. Photo courtesy of Peel-Harvey Catchment Council.

In the third quarter of 2019, however, the representatives of ACORJUVE decided not to follow the agreed-upon path to transition proceeds to the foundation. In 2020, we again approached the association to restart negotiations and work toward the execution of the agreement signed in 2018, but the association declined.

An executive group formed by Alcoa, ACORJUVE and INCRA was reinstated in 2021 to define the compensation paid to the communities. In July 2021, ACORJUVE presented its proposed statute for the creation of the foundation, and we will work with both parties to complete the foundation's formation.

In December 2021, Alcoa and ACORJUVE signed a Protocol of Intent with the general purpose of improving bilateral relationships and trust. The aim is to build mutual respect, transparency and good faith and define common understanding and intentions.

From mine startup in October 2009 through December 2021, Alcoa has paid US\$27.2 million in royalties to ACORJUVE.

SURINAME

Since ceasing all mining activities in Suriname in 2015 and permanently closing the Paranam alumina refinery in 2016, we have been working on closure plans for the remaining mine sites that require rehabilitation in the Para district. In 2021, we completed 120 hectares (297 acres) of rehabilitation. (See the [Facility Stewardship and Transformation](#) section.)

We engaged with the Kaliña and Lokono Indigenous communities in 2018 regarding past mine rehabilitation efforts at Wane Hills in the Marowijne district. In 2019, the National Association of Indigenous Village Leaders in Suriname (MIDS) and the Organisation of Kaliña and Lokono in Marowijne (KLIM) sought additional input from their communities on how to further implement restoration activities for the areas disturbed during the mining period. In late 2020, we held additional discussions with these groups on how to prioritize this work.

In 2021, Alcoa Foundation awarded a grant to KLIM to develop a capacity-building and income-generation project based on the results of these internal consultations. Eight Indigenous villages of the Lower-Marowijne region that are members of KLIM will undertake environmental education and protection efforts to preserve their culture and history and, at the same time, develop nature tourism and environmental education.

Activities to be undertaken by the Indigenous villages will include cleaning up ancestral areas along Wane Creek that were abandoned when establishing a protected area



Cassava and poultry processing unit with poultry pens in the background. As part of our mining agreement in Suriname, we are completing community development work, including establishing a cassava and poultry processing unit.

and later bauxite mining in that area. Cabanas, lodges and day camps will be set up for villagers and tourists.

Nature educational materials will be developed for on-site education as well as for schools and national media. KLIM members will be trained as Indigenous tour guides and in tourism and tour-operator management, providing a much-needed source of income for villagers. KLIM members also will be trained in project management, tour management and financial/administrative management. The Wane Creek tourism destination will be coupled with other tourism destinations and attractions in the region, such as the giant Galibi sea turtles.

Through this project, KLIM wants to increase environmental, cultural and nature education and awareness and promote employment opportunities for the Indigenous villages.

As part of an initial pre-mining agreement with the Maroon village of Adjoema Kondre, we are also completing a community development program in the Marowijne district. This program consists of the following construction projects identified through a needs assessment study within the community:

- Multiple toilet facilities within the village
- Mini soccer field with fencing
- Four boat ramps for river access
- Cassava and poultry processing unit
- Six breeding pens for poultry
- Strategically placed signs that provide directions from the public road to the village of Adjoema Kondre

We also are supporting the training of designated community members in the sustainable use of a cassava processing machine, sustainable poultry farming and basic food safety standards.

Supporting LGBTQI Community with Pride



Through a kaleidoscope of color and special events, our Australian locations made their commitment to lesbian, gay, bisexual, transgender, queer and intersex (LGBTQI) inclusion and diversity visible throughout 2021.

Key activities included:

- Around 100 of our employees marched in the Perth Pride Parade. Alcoa has participated in the parade since 2014, the first resources company to do so.
- During Alcoa Global Pride Week in June, rainbow crosswalks at the Pinjarra location, rainbow trees at our Booragoon offices and rainbow stairs at our Wagerup operations made a colorful statement of support. Our Kwinana location hosted awareness lunch-and-learns during the week.
- At the June meeting of our Australian chapter of Employees at Alcoa for Gay, Lesbian, Bisexual and Transgender Equality (EAGLE) inclusion group, an employee shared her personal journey as a woman with a transgender experience to more than 150 colleagues across Australia and Brazil.
- Purple reigned in August when our employees dressed in the bright color on Wear It Purple Day to support young people identifying as LGBTQI.

In 2021, Alcoa was named a Bronze Tier Employer and leading resources company under the Australian Workplace Equality Index program, the national benchmark for LGBTI workplace inclusion. We have participated in the program since 2014.



It Is Okay to Not Be Okay



“It is okay to not be okay, but it is not okay to not talk about it” was the key message shared with around 90 of our Western Australian apprentices during mental health sessions held in 2021.

Mental health service provider [Youth Focus](#) presented three sessions covering how to have a conversation about mental health when things are not going quite right, and where our apprentices can get help. The latter includes community resources, our Employee Assistance Program and their apprentice supervisor.

One in four young people in Australia live with mental illness, and statistics show suicide is the biggest killer of young Australians. To help address the issue, we have a long-standing partnership with Youth Focus to deliver free mental health services for young people in the Kwinana, Peel and upper South West areas along with school, family and community education programs.

“I gained a better understanding of how mental health can impact an individual in their everyday life, the different contributing factors to mental illness and the various behaviors to recognize and act upon,” said Brayden Watson, third-year electrical instrumentation apprentice. “When a mate, colleague or someone I know is going through a tough time, asking for help is not a sign of weakness but a sign of strength. Talking about your feelings and things you’re going through to someone you trust will only help your situation.”

Added Jessica Morgan, mechanical fitter apprentice: “A big topic that stuck with me personally was the early warning signs of someone who may be hurting themselves or thinking of committing suicide, because I think this isn’t discussed as much as other topics.”

Our People

5 GENDER EQUALITY



8 DECENT WORK AND ECONOMIC GROWTH



10 REDUCED INEQUALITIES



We are on a mission to build a stronger “everyone culture”—where our Values drive everyday decisions, and employee development is seen as a catalyst for continuous improvement, increased engagement and breakthrough performance.

Inclusion, Diversity and Employee Experience

Our purpose and values set the foundation for our equity, inclusion and diversity journey. We seek to provide a trusting workplace that is safe, respectful and inclusive and reflects the diversity of the communities where we operate.

OUR DEFINITIONS

Inclusion is how we respect and leverage our differences to achieve our goals.

Diversity means all the ways that we differ, including cognitive diversity.

Whether in our operations or offices, the intent of equity, inclusion and diversity is to ensure that everyone has access to the same opportunities, fair pay and an environment that is welcoming, where employees feel valued and accepted. This is the foundation of an “everyone culture”, where employees feel empowered to build solutions through innovation, coaching and collaboration.

Our key focus areas for equity, inclusion and diversity include:

- Continuing to strengthen our foundation, build more awareness and drive accountability
- Leveraging the diverse methods that employees use to perceive and process information, which will drive innovation and a more inclusive culture
- Diversifying our applicant pool
- Diversifying hiring and promotions
- Improving our employee experience to retain diverse employees
- Managing pay equity and pay fairness across our diverse employee populations

Inclusion and Diversity Strategy

We measure the impact of our inclusion and diversity strategy through employee engagement; the percentage of diverse applicants, hires, promotions, and retained employees; and pay equity assessments.



Impact Measures



Formed in 2020, our Global Inclusion & Diversity Council (GIDC) has primary accountability for ensuring execution of the company's long-term I&D strategy. The Global Inclusion & Diversity Council consists of diverse leaders from across our operations in all regions including Executive leadership representation. In 2021, the GIDC championed inclusion and diversity initiatives visibly and broadly, including:

- Actively participating in and supporting the growth of our global inclusion groups
- Sponsoring our "Everyone Matters" self-identification initiative
- Encouraging leaders below the executive level to participate in efforts that drive organizational change
- Supporting the expansion of our communication plan for inclusion and diversity

Our inclusion groups include the Alcoa Women's Network (AWN); Employees at Alcoa for Gay, Lesbian, Bisexual and Transgender Equality (EAGLE); and Alcoa's Working Actively for Racial-Ethnic Equality (AWARE). They serve as platforms for all employees to champion inclusion and diversity programs and lead allyship and learning opportunities.

After first launching AWARE in November 2020 in Brazil to raise awareness, promote a culture of fairness and influence our organization to advance racial justice and equality, we launched the inclusion group globally in 2021. We're working to grow our existing inclusion groups and offer more, including an internal organization that will work to connect those with disabilities and their allies. We launched ABLE (Alcoa's moving Beyond Limited Expectations) in Brazil during 2021 to help foster a work environment that promotes genuine inclusion of people with disabilities and raise awareness among our employees about the unique needs and talents of each individual, helping ensure everyone feels accepted, valued and treated fairly. We will be launching ABLE globally in 2022.

With the increased engagement of our inclusion groups and the support of our executive leadership team, we explored other methods to connect employees through allyship. During 2021, our Inclusion & Diversity (I&D) groups hosted global events for employees with external speakers:

- In celebration of International Women's Day, AWN hosted a question-and-answer session with Carol Roberts, a member of our Board of Directors, about her experiences as a female leader in manufacturing.
- AWN and AWARE hosted guest speaker Rachel Maia, who shared her perception of success, challenges and learnings as a Black female leader and an executive with companies that include Novartis Pharmacy and Tiffany & Co.

- At an EAGLE-sponsored event, Bobbi Pickard, CEO of Trans in the City and D&I Director at BP, spoke about transgender issues and awareness.

During 2021, AWN introduced the HeForShe Campaign, which is a solidarity campaign for the advancement of gender equality initiated by the United Nations. The campaign's goal is to achieve equality by encouraging men and people of all genders to be agents of change and take action to help achieve gender equality.

Another positive step during the year was the introduction of CEO Connection calls for members of our various inclusion groups. The calls provided an avenue for employees to discuss how we collaborate to make Alcoa an even better place to work. Employees were encouraged to bring their comments and questions about creating a culture where everyone can feel supported in a safe and trusting environment.

For the CEO Action for Diversity and Inclusion's Days of Understanding, we hosted a global employee forum facilitated by our President and CEO that also featured Professor Kenji Yoshino, an internationally acclaimed author, speaker and law professor. Professor Yoshino described his research on "covering," a universal practice where people minimize disfavored traits to blend into mainstream culture.

We launched our "Everyone Matters" self-identification initiative in the fourth quarter of 2021 to build a more complete picture of our workforce, helping to build a workforce that is representative of the communities where we operate. The information gathered will help strengthen our inclusion and diversity efforts globally. The process is voluntary, and we plan to send frequent reminders to encourage participation.

To further support our inclusion and diversity priorities, we continue to expand the Catalyst for Change program, first launched in 2020, beyond our executive leadership team to include front-line managers and above. Under the program, leaders voluntarily pledge to promote inclusion and diversity through actions that include championing or leading inclusion groups, mentoring diverse employees, promoting flexible work arrangements, leading awareness training in unconscious bias and more.

The most impactful actions are often those that influence decisions at the regional and local level. Highlights of such actions during 2021 included:

- **Australia:** We continued the expansion of PRIDE week, Wear It Purple, annual PRIDE parade participation and other initiatives. The Women in Operations and Maintenance cohort also provided women with the opportunity to network, attend trainings and hear from guest speakers.
- **Brazil:** We created partnerships with the Brazilian Corporate Social Inclusion Network (REIS) and the Movement for Racial Equity Coalition (MOVER).
- **Canada:** A number of female employees from our Bécancour location participated in the Ambition Challenge, a professional development program that helps empower women to maximize their potential.
- **Iceland:** To increase I&D awareness, our Fjarðaál location in Iceland offered employee workshops focused on culture, communications and I&D competencies.
- **Norway:** EAGLE launched a joint chapter for our smelters in Lista and Mosjøen and the Oslo office location.
- **United States:** Plans were initiated to launch a North America Council, which will be a collaboration between all inclusion groups and plant/location leadership.

COMMUNICATION AND TRAINING

We are not only working to improve our equity, inclusion and diversity, we are also embracing authentic and transparent communications.

In 2021, we shared with our employees a global inclusion and diversity calendar that included global celebrations and monthly topics to increase knowledge and awareness, both locally and regionally.

We also deployed an I&D intranet page that includes information on our current strategy, past and current events, GIDC, our inclusion groups and various resources. Other communication avenues included social media posts via Alcoa's corporate accounts, participation in town halls, inclusion in internal newsletters and a refreshed corporate website.

Inclusion and diversity training provides an opportunity to broaden employee perspectives and the role they play in driving an inclusive and diverse environment. In 2021, we offered training in I&D topics that included unconscious bias, how to be an ally, and microaggressions.

GENDER EQUITY

In 2021, we conducted a gender pay equity analysis, our third year to complete a study supervised by a third-party consultant using commonly used methodology. The following are key findings of the study, which focused on salaried employees:

- Pay within band (equal pay for same job level) by country and functional area: one percent gender pay gap, which is considered pay parity.
- The pay gap is primarily due to the distribution of women throughout the various levels of the organization.

We are committed to achieving gender balance throughout our company and are working to further advance our pay fairness strategy to improve pay equity. This includes increasing transparency and focus on diversity during all discretionary compensation processes to mitigate unconscious bias. We will continue to focus on defining actions to improve overall gender equity, as well as talent management practices across the employment cycle.

A percentage of our annual Incentive Compensation program, which is available to top leaders as a portion of their overall compensation potential, is linked to balancing our gender equality and diversity. It is a way to drive accountability, accelerate actions and measure progress.

The 2021 inclusion and diversity target represented 10 percent of our Incentive Compensation formula and included two diversity metrics focused on increasing:

- The percentage of new hires from underrepresented populations*
- The percentage of women in our global employee population
- Increased percentage of women in our global employee population from 15.6 percent to 17.17 percent
- The percentage of new hires from underrepresented populations was 38.06 percent

Our approach in 2022 will continue to focus on increasing diversity, including gender and underrepresented groups.

2021 Global Women

Diversity Indicator	Percentage
Females on the Alcoa Corporation Board of Directors	30.0
Female share of total workforce	17.2
Females in all management positions	27.3
Females in junior management positions	27.5
Females in top management positions	27.0
Females in management positions in revenue-generating functions as a % of all such managers	48.9

Our global women calculation is based on all categories of employees, including full and part-time permanent, full and part-time apprentice, and graduate employees.

*Includes women (global), ethnicity (U.S., Brazil, Australia) and disability (U.S. and Brazil).

EMPLOYEE SURVEYS

Our culture shapes the day-to-day environment and impacts talent and business outcomes. We are evolving our employee survey strategy and structure to get feedback in a quantitative fashion so we can continue to improve the experiences of our employees in their Alcoa careers.

In April of 2021, we launched our first global employee survey that will establish baselines to monitor for progress.

In 2021, we deployed the ACT methodology (Acknowledge, Collaborate and Take one step forward) to advance our goal of listening to our people and creating follow-up actions in response to the survey's feedback. All leaders were responsible for conducting a conversation with their teams, acknowledging the feedback, collaborating on focus areas and deciding how to take one step forward together.

As we progress, we are moving toward an 18 month cadence for an engagement survey followed by shorter, ad hoc pulse surveys in that will measure progress on specific areas of focus such as employee wellbeing, flexibility and decision-making. We have also leveraged key standard questions that enabled us to compare our results against global norms and refine our areas of focus for action.

Ad hoc pulse surveys measure progress on employee and organizational priorities. In the second half of 2021, we deployed a survey on flexible work arrangements. The feedback informed our approach to a flexible work model.

It remains crucial to effectively measure and respond to employee feedback to shape their experiences at Alcoa. Employees seek more than just financial gain from their employer, requiring a holistic approach that includes wellbeing, a sense of connection, and purpose.

FLEXIBILITY FIRST

Our Care for People value is ingrained in the decisions we make, and our Lead with Courage value encourages employees to challenge the status quo and to embrace opportunities to reinvent. We want to build an environment where people can do their best work and thrive.

As part of our Flexibility First initiative launched in 2021, we are moving to a permanent flexible work model for portable, knowledge-based roles. We are in the early stages of this journey and will encourage experimentation through an iterative process.

The approach will provide flexibility over where, when and how we work in the following ways. Practices may vary slightly in different countries to comply with local regulations:

- **Where:** Flexibility to determine a work arrangement that aligns to the role and personal needs and is segmented into three categories:
 - ✦ **On-site:** Work 60 percent or more of contracted hours at an Alcoa site
 - ✦ **Hybrid:** Work less than 60 percent of contracted hours on-site
 - ✦ **Remote:** Work fully remotely from home
- **When:** Flexibility for employees to set a work schedule so they have greater influence over when to begin and end their workdays. For many office-based roles, this may involve working non-consecutive time blocks that add up to a full day, respecting that early starts and late evenings are not uncommon in our current operating model. At all times, we will be driven by the work that needs to be completed.
- **How:** Flexibility to enable employees to take better care of themselves and others through greater opportunities for part-time and job-share options.

We believe Flexibility First helps many Alcoans improve their work-life harmonization and well-being while continuing to make Alcoa an even stronger company and employer.

PERFORMANCE

Our inclusion, diversity and equity efforts received numerous honors in 2021. We were named to the [2021 Bloomberg Gender-Equality Index](#) and the Forbes 2021 [America's Best Employers for Diversity](#) list. We also received a score of 95 on the Human Rights Campaign Foundation's [Corporate Equality Index 2021](#).

2021 Employees by Employment Contract and Type

	Contract		Type	
	Permanent	Temporary	Full-time	Part-time
Male	10,890	487	10,854	523
Female	2,257	193	2,125	325
Other	2	–	2	–
Total	13,149	680	12,981	848

Permanent employees include permanent, apprentice and graduate employees. Temporary workers are employed as casual or limited-term workers with a contract of limited duration that often terminates along with a specific event (e.g., end of a project, a permanent employee returning from leave or the completion of a stated period of time).

2021 Employees by Region and Employment Status

	Permanent	Temporary
Asia/Australia	4,453	116
Europe/Middle East/Africa	2,588	563
North America	3,877	1
South America	2,229	0

2021 Turnover Rate

Percent

	Overall	Voluntary
Male	9.6	7.7
Female	11.5	8.7
Total	9.9	7.9

Out of the 7.9 percent voluntary turnover in 2021, 3.2 percent was due to retirement.

Talent Acquisition

In 2021, we continued taking steps to elevate our efforts in talent acquisition. We significantly increased our presence in our local communities and strengthened our messages to the market about the opportunities available at Alcoa to launch and grow a career. We redesigned our [Careers page](#) on Alcoa.com with a clear focus on innovation, diversity and life at Alcoa through personal accounts of our people. These stories bring to life the opportunities at Alcoa.

Our outreach to the market has been further diversified through prominent and consistent social media engagement and the introduction of proactive sourcing tools to identify and attract top talent.

At the location level, we seek to hire local candidates when possible. We engage with colleges and universities to identify top local talent, and we offer internships and apprenticeships to help develop the local workforce.

Our talent acquisition team continues to keep diversity at the forefront of its actions, advertising opportunities through channels that include diverse populations. We also continued to engage our internal inclusion groups to gather input, opinions and perspectives to successfully engage with our talent targets. In addition, we aim to ensure that all candidates experience some level of diversity in their interviewing panel. Such diversity can range from gender and race to diversity of thought and experience. We have further expanded the focus on diversity through the introduction of diversity training and reminders to hiring managers and interviewers throughout the recruiting journey.

Key achievements in acquiring talent in 2021 included:

- Our 2021 placements (internal placements + external hires) significantly exceed 2020 results, with 3,340 positions filled during the year compared to 2,002 in 2020.
- Females interviewed for opportunities increased to 22.8 percent of candidates compared to 20.8 percent in 2020.
- Females hired increased to 27.0 percent from 22.3 percent in the prior year.

People Development

People development is a fundamental enabler of our [Care for People value](#).

Throughout 2021, we continued developing our employees despite the ongoing challenges presented by the pandemic. Managers and employees stayed connected via regular check-ins, maintaining alignment and providing opportunities to ensure collaborative and productive engagement.

In 2021, we continued with a key focus on our People Development Process (PDP) that included educational materials for employees and supervisors to host meaningful check-in conversations, taking the current pandemic into consideration, as well as giving and receiving rounded feedback. Our rounded feedback process provides a means to share diverse perspectives, enables an even more inclusive work environment. In addition, we linked career check-ins to our integrated talent cycle to ensure employee career aspirations are thoughtfully considered when making talent-related decisions.

The check-ins are the core of our PDP process. Meaningful conversations between managers and employees are driven through the use of the following four contribution factors:

- Performance against goals, including individual contributions
- Demonstration of Alcoa behaviors
- Impact to the business and team
- Use of development for success

We held people review meetings within each operational location and function to obtain a snapshot of the talent, create succession plans for critical roles and action plans for key talent, and develop regional/local talent agendas. These meetings are part of our ongoing talent and succession process, with the outcomes helping guide future development programs.

We continued to evolve our succession planning for the 155 critical roles identified in 2020, along with additional roles identified throughout 2021. Critical roles are identified based on standardized criteria and input from senior leaders, and they are tracked and discussed in people review sessions throughout the year.

In evaluating our succession health for critical roles, we use criteria that will consider a position healthy if it has three successors for each position, with at least one female/diverse successor. Of the 205 roles identified as critical through 2021:

- 67.8 percent had at least one successor assessed as ready now or within 12 months
- 44.9 percent had at least two successors assessed as ready now or within 12 months
- 24.9 percent had three or more successors
- 65.9 percent had at least one female/diverse successor

In 2022, we will be focusing on creating additional non-linear development routes by providing employees with opportunities to move more between functions and operations. This talent sharing will expand employee knowledge of our varied business areas.

Our talent development goal in 2021 was to accelerate the modernization of our learning solutions to encourage a growth mindset and self-guided learning.

Our redesigned leadership development framework supports our leaders at all levels across the business. Programs focus on building business acumen and the skills required to excel in a post-pandemic business environment, including agility, innovation, and leading remote work across teams.

Through partnerships with top vendors and business schools, our 2021 programs were redesigned with a hybrid approach to accommodate all learning needs while ensuring social distancing requirements in our regions.

Our Advancing Supervisory Excellence (ASE) program was refreshed with new content and implemented globally. To further complement our leadership learning, we launched our Transformational Leadership Development (TLD) cohort-based program in September 2021 and Alcoa Management Essentials (AME) in early 2022.

In 2021, we took a big leap in preparing our people in an evolving world through the creation of a Gigs program. This short-term, internal movement opportunity enables employees to apply and expand their existing skills in different areas of the business while developing new skills through meaningful contribution. This program matches business opportunities with the right internal talent while building agile and diverse teams.

To maximize the benefits of our online tools, we partnered with Microsoft to offer monthly learning sessions. Hosted by a Microsoft expert, these sessions are designed to showcase how tools and technology can be leveraged to work and collaborate in a more agile way.

In addition, all salaried employees have unlimited access to our Workday Learning Management System (LMS) that houses more than 12,000 courses, with content reviewed and added on a regular basis.

We have partnered with Udemy for Business, which is a top content provider in the market, to provide more diverse and relevant courses for self-guided learning. This partnership increases our current learning portfolio to more than 20,000 courses with availability in several languages spoken at Alcoa.

In 2021 we had more than 34,000 enrollments in digital courses housed within our LMS system and 9,183 enrollments for our blended courses (instructor-led plus digital).

To cement our policies and business culture, we rolled out two trainings related to ethics and compliance to targeted employees across regions using our LMS. They were mandatory for all salaried employees, with a combined completion rate of 91 percent.

We continue to support employee participation with professional certifications, leadership development and other external training programs not tracked through our learning management system, when feasible.

2021 Course Enrollments

Employee Type	Blended Courses			Digital Courses		
	Enrollments	Number of Employees Using the System	Average Enrollments per Employee	Enrollments	Number of Employees Using the System	Average Enrollments per Employee
Hourly	4,608	1,563	2.9	11,447	1,516	7.6
Salaried	4,575	1,762	2.6	23,095	4,714	4.9

2021 Course Completion Rates

Employee Type	Blended Courses			Digital Courses		
	Courses Completed	Number of Enrollments	Average Completion (percent)	Courses Completed	Number of Enrollments	Average Completion (percent)
Hourly	3,433	4,608	75	9,830	11,447	86
Salaried	3,739	4,575	82	20,180	23,095	87

2021 Employee Training

Per Full-Time Equivalent	
Average hours of training and development	31
Average amount spent on training and development	US\$922

Data is for formal classroom hours and tuition reimbursement.

Total Rewards

We work to provide a competitive, balanced portfolio of total rewards to attract, engage and retain employees who can contribute to the overall success of our Company.

Total rewards encompass both financial and non-financial components.

Financial components include:

- Fixed pay and allowances, based on market competitiveness and local pay practices.
- Variable short-term incentives, which are linked to local or global priorities and typically focus on the achievement of both financial and non-financial targets. Employee awards are meaningfully differentiated based on individual performance and contributions.
- Reward and recognition (R&R) programs, which are awarded quarterly and annually, are discretionary awards designed to reward employees for outstanding performance or exemplary demonstration of our Alcoa Values. The R&R programs can also be used to help retain high-contributing employees. The programs include cash and stock.
- Core long-term incentive awards are designed to attract and retain senior leaders who can help influence long-term performance. It ensures senior leaders have a significant proportion of their compensation tied to stockholder interests.

In 2021, we again linked 30 percent of our annual Incentive Compensation plan to non-financial metrics focused on safety and inclusion and diversity. The two inclusion and diversity objectives (percentage of underrepresented employee hires and percentage of global women) exceeded our internal goals. The results for safety were partially met based on having zero fatal injuries, but we did experience three serious injuries during the year.

2021 Sustainability Incentive Compensation Targets

Percent

Category	Weight	Weighted Result
Inclusion and Diversity	10.0	14.4
Safety	20.0	30.0

For additional compensation information and data, see the [Shared Value Creation](#) section of this report and the Compensation Discussion and Analysis in our [2022 Proxy Statement](#).

Labor Relations

We believe in freedom of association no matter where we operate around the globe. Each year, we negotiate labor agreements with various unions across our global operations. In 2021, we had 31 agreements in place that covered approximately 75 percent of our total workforce.

At our San Ciprián location in Spain, smelter and refinery employees initiated strike actions that blocked shipments from the facilities. On December 29, 2021, Alcoa and the workers' representatives at the Company's San Ciprián aluminum plant in Spain reached an agreement aimed at resolving ongoing challenges that stem from exorbitant energy prices for the aluminum smelter.

The agreement calls for a two-year curtailment of the smelter's 228,000 metric tons of annual capacity, and a commitment by the Company to begin the restart of the smelter in January 2024.

During the curtailment period, Alcoa will seek to secure as soon as possible long-term power purchase agreements, beginning from 2024. The Company committed to provide employees full wages and benefits during the two-year curtailment period, to extend the contracts of contractor companies through 2024, and to provide a new collective bargaining agreement that includes pay increases extending to the end of 2025.

The Company also has committed that no collective dismissal process will be considered for the San Ciprián smelter until December 31, 2025 at the earliest.

Active Workforce Covered by Labor Agreements in 2021

Country	Percent Covered
Australia	64
Brazil	100
Canada	67
Hungary	100
Iceland	98
Netherlands	0
Norway	100
Spain	80
United States	72

Safety and Health

3 GOOD HEALTH AND WELL-BEING



8 DECENT WORK AND ECONOMIC GROWTH





Our aspiration is to work safely at all times. We attend to health and safety of our employees and contractors before any other priorities, putting the protection of human life above production, profit or any other business imperative. Underscoring this commitment is our [Care for People Value](#).

Our work can be hazardous, difficult and complex. It is imperative that we have a pervasive health and safety culture and strong systems that equip our people with the tools, skills, knowledge, controls and protection to avoid injuries and illnesses and, most importantly, fatalities.

We ask all employees and contractors to be proactive in identifying and reporting to their supervisor or location EHS personnel unsafe work practices or hazardous situations, using rigorous pre-job assessments to identify risks before work starts. We also empower employees and contractors to stop a job if they are unsure if it can be performed safely. As stated in our [Code of Conduct](#), retaliation is prohibited against an employee or contractor for asking a question or raising a safety concern in good faith.

Each day, we strive for what we believe is the ambitious yet attainable goal of zero fatalities and zero life-threatening or life-altering injuries and illnesses.

Safety

Our systems are designed to prevent the loss of life or serious injuries. This is our most fundamental objective. Supporting this is our safety strategy, which centers on fatality prevention, risk management and safety leadership.

In 2021, we had zero employee or contractor workplace fatalities. However, we had 3 serious injuries that underscored the need for continuous improvement.

Our fatal and serious injury/illness potential (FSI-P) rate in 2021 was 1.07 incidents per 100 full-time workers, which was a 24 percent decrease compared to 2020.

Our operations leaders conducted more than 280,000 critical control verifications for fatality risks in 2021, highlighting our relentless focus on fatality prevention. Proactive, transparent reporting and calibration of risk perception also continued to mature across the company. A key priority for 2021 was closing corrective actions and applying a robust and consistent lessons-learned process. This continues to indicate a healthy risk management system, building on our ability to recognize, learn from and prevent incidents. The longer-term trend also indicates a positive, downward trajectory of safety incidents.

In 2021, we addressed more than 1,691 corrective actions for FSI incidents and proactively identified 451 fatality risks, further reducing risk to our employees.

Our Executive Team and other senior leaders review significant incidents, corrective actions and effectiveness of controls and also sponsor company-wide hazard-mitigation initiatives. We actively share good practices and learnings across our operations and recognize and promote outstanding performance through our EHS Excellence awards.

Our OneAlcoa safety approach and comprehensive contractor management framework integrate temporary workers, contractors and visitors into our safety programs and data systems. While we have seen some year-over-year increases in our lagging indicator rates as we better identify risks with these groups, all of our rates have remained significantly below the most recent U.S. manufacturing averages.

We conduct data recordkeeping audits, injury classification reviews and other reviews on an ongoing basis to ensure accuracy and consistency in our recordkeeping and reporting. Comprehensive safety data is provided in the [Appendix](#).

Days Away, Restricted and Transfer Rate Employees and all contractors

	Global	U.S. Manufacturing Average	Australia	Europe	North America	South America
2017	0.62	2.0	0.85	0.63	0.82	0.22
2018	0.71	2.0	0.96	0.64	1.03	0.27
2019	0.87	2.0	1.21	0.82	1.26	0.35
2020	0.61	1.8	1.21	0.58	0.65	0.24
2021	0.57	–	1.42	0.46	0.60	0.12

The 2021 Bureau of Labor Statistics U.S. manufacturing industry average was not available at the time this report was published. 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.

Fatalities

Employees and all contractors

	Global	Australia	Europe	North America	South America
2017	0/3	0	0/1	0	0/2
2018	0	0	0	0	0
2019	0	0	0	0	0
2020	0/1	0	0	0	0/1
2021	0	0	0	0	0

Lost Workday Rate

Employees and all contractors

	Global	U.S. Manufacturing Average	Australia	Europe	North America	South America
2017	0.25	0.9	0.49	0.12	0.20	0.16
2018	0.22	0.9	0.41	0.09	0.24	0.11
2019	0.25	0.9	0.52	0.26	0.11	0.18
2020	0.22	0.9	0.53	0.11	0.11	0.16
2021	0.25	–	0.67	0.18	0.19	0.07

The 2021 Bureau of Labor Statistics U.S. manufacturing industry average was not available at the time this report was published. Lost workday rate represents the number of injuries and illnesses resulting in one or more days away from work per 100 full-time workers.

Fatal and Serious Injuries/Illnesses

Employees and all contractors

	FSI Actuals (Events resulting in a fatal or serious injury/illness)	FSI Potentials (Near-miss events)	Total FSI Events	Total FSI Rate
2017	5	433	438	1.86
2018	3	427	430	1.84
2019	3	339	342	1.38
2020	1	387	388	1.41
2021	3	309	312	1.08

A serious injury/illness is any incident that is life-threatening or life-altering. FSI rate is FSI actuals and potentials per 100 full-time workers.

Total Recordable Incident Rate

Employees and all contractors

	Global	U.S. Manufacturing Average	Australia	Europe	North America	South America
2017	1.57	3.5	1.96	1.36	2.37	0.45
2018	1.66	3.4	2.38	1.45	2.41	0.55
2019	1.77	3.3	2.27	1.48	3.00	0.54
2020	1.37	2.8	2.27	1.28	1.90	0.42
2021	1.22	–	2.61	1.70	1.53	0.20

The 2021 Bureau of Labor Statistics U.S. manufacturing industry average was not available at the time this report was published. Total recordable incident rate includes days away, restricted and transfer cases plus cases that involve days of medical treatment or other recordables per 100 full-time workers.

FATALITY RISK MANAGEMENT

Each location is responsible for developing a registry of all significant safety hazards and either eliminating the hazards or implementing controls to prevent or mitigate the risks associated with those hazards. Our corporate safety group provides global oversight and verification with assistance from our regional vice presidents of operations.

Our six most significant risk categories that could cause a fatal or serious injury are mobile equipment, crane safety, confined space, fall control, lock/tag/verify and electrical. We also have a fatality risk that is specific to each production process—earth-moving equipment (mining), chemical burns (refining) and molten metal (smelting/casting). In 2021, we reviewed these risks and conducted an in-depth analysis of incidents and learnings to identify improvements to our fatality risk standards and critical controls.

We have identified the critical controls for each of the fatality risks, and our supervisors and managers undertake field verifications to assess the effectiveness of these critical controls. When a critical control is assessed as not effective, improvement actions must be implemented. In 2021, we targeted improving the quality of the critical control field verifications and focused on increasing the number of ineffective critical controls reported so we can implement improvement actions to address them.

We recently transitioned to an in-house critical control field verifications application to record and report data and information related to critical control field verifications. This will enable us to better align our critical controls to our operations processes, manage changes to the system more effectively and provide enhanced reporting capability to drive improvement.

Each location's leadership, employees and some contractors use the tool. At a minimum, we require one field verification to be conducted per week for operations managers, one per day for supervisors and one per shift for group leaders. We plan the verifications to ensure we cover high-risk activities in all areas of our plants.

SAFETY STANDARDS

After an extensive update of our safety standards in 2018, each location conducted a gap analysis against the new standards in 2019 and developed a three-year action plan to close identified gaps.

In 2021—the second year of the plans—each location again prioritized its actions based on operational risk profiles. We track action to completion, closing 1,073 actions in 2021.

HUMAN PERFORMANCE

Our locations use what is known as Human Performance (HP) principles in our daily path of work. Human Performance teaches employees how to anticipate and recognize situations where errors are likely to occur. This tool helps to predict, reduce, manage and prevent fatalities and injuries.

We are further integrating our fatality risk management processes with HP processes in pre-shift meetings. We have tested digital daily visual management boards at one location in each region, with global implementation planned for 2022. These boards use HP and critical risk concepts to set up the crews for a safe, productive shift.

As part of HP, all of our employees and contractors are empowered to stop work if they believe the situation is unsafe or if they are unsure of the potential outcome. In our April 2021 employee survey, 88 percent of respondents indicated that they feel they can stop work if unsafe. This result is very encouraging.

SAFETY GOAL

In 2021, all salaried employees were expected to include a safety objective in their annual performance objectives, regardless of where they worked or what job they performed. Having an individual safety objective empowers our employees to reinforce a strong safety culture. Goals commonly related to critical risk management and HP.

VISIBLE SAFETY LEADERSHIP

Each day, we demonstrate that safety comes first—before production, before profit, before everything. We strive for a culture of transparency, where we put the well-being of every employee, temporary worker, contractor and visitor before any departmental or operational consideration, where we show with our actions that safety is more important than other business imperatives, and where we openly and actively share both our good ideas and our setbacks.

Our EHS Leadership Training Program focuses on expectations and behaviors for leaders in our workplaces. Aligned with our Values, the training is designed to enhance and nurture our EHS culture and ensure that our leaders have the tools, competence and confidence to effectively manage EHS at their locations. They learn to set expectations through their visible actions and behaviors.

The training is intended to build strong and consistent leadership that demonstrates on a daily basis a continuous commitment to safe and fatality-free production that will drive us to zero fatalities.

EHS MANAGEMENT SYSTEMS

EHS Management System

Our ISO-certified corporate EHS management system provides a universally recognized management framework for our EHS risk evaluation, planning, objective setting and operational control activities at all locations. The system covers both employees and contractors and is available online to them, providing access to relevant EHS information.

At the end of 2021, 16 of our locations were certified to the ISO 14001 Environmental Management System standard, and three locations were certified to the ISO 50001 Energy Management Systems. Three of our locations were also certified to the ISO 45001 Occupational Health and Safety Management System standard.

We continued digitizing our EHS systems, workflows and technology in 2021 to better enable information self-service and effective information sharing. At the core of an operator-centric approach is access to rich, relevant and timely information to inform decision-making at all levels of the organization. Digital tools, data and analytics are an integral part of our EHS management programs, contributing to a reduction in incidents and better risk management.

We conducted an EHS management review in mid-2021 to ensure continuing suitability, adequacy and effectiveness of the EHS management systems and processes. Overall, the review found these processes to be effective, and the process outcomes and products were as expected.

Risk-based Audits

Our periodic risk-based audits emphasize observing people and processes at the location where the work is performed to accurately assess the risks.

We conduct audits every two to three years for operating locations, and we evaluate non-operating locations and joint ventures for audit applicability based on risk. Despite the ongoing impact of the pandemic, we remained on schedule with no major audit delays or cancellations.

An audit team that consists of internal EHS professionals, our operational subject matter experts and external consultants collaborates with location personnel to identify a site's critical risks. While team members normally spend up to 80 percent of their time on the shop floor, we developed a remote process in 2020 to accommodate travel restrictions due to COVID-19.

In 2021, team members worked with location personnel to assess systems, processes, risk and compliance via conference calls and web meetings. In addition, site personnel conducted verifications and shared information via photos and video.

Our auditor training program continues to improve the quality of our risk-based audits. Our goal is to have every auditor complete the training before participating in an audit. Since 2020, we have certified 146 auditors.

Root-cause Analysis

We use formal and standardized processes to investigate our EHS incidents, and we select an investigation methodology based on the incident's level of significance. We also use a comprehensive root-cause methodology to investigate actual FSI incidents and significant FSI potentials. Our investigation analysis tools allow us to evaluate, prioritize and address the critical causes and drivers behind an incident, as well as report the findings and learnings across all locations.

Since 2018, we have organized several training classes with a related certification process on root cause analysis for employees and some contractors to improve the effectiveness of our incident investigations. At the end of 2021, we had 165 certified root-cause facilitators.

Case Study

Training Program Builds Elite Safety Technicians

Training

Employees at operating locations are required to take regular environment, health and safety training that is determined by their specific roles, areas where they work, job functions and responsibilities. The location's EHS and human resources personnel determine the training that is required for each employee.

Communication and Engagement

We believe if workers participate more in EHS activities and initiatives, our EHS performance will improve. We regularly communicate with employees and contractors about workplace EHS matters and provide ways for them to become involved in hazard identification, assessment and prioritization, training, program evaluation and improvement activities. We strive to provide prompt responses to reports and improvement recommendations.

Many of our locations also have formal joint management-worker EHS committees, where employee representatives are involved in strategic and tactical EHS reviews and decision-making.

Our corporate EHS Lead Team and EHS Council meet frequently to provide direction, strategy, oversight and analysis of activities and performance. Meeting agendas are a comprehensive mix of strategic and tactical content with operational, cross-functional and global representation to obtain genuine ownership, accountability and sponsorship.

Heitor Parenti Junior believes bringing people together for learning is a key component of creating a safer workplace, and it also can have an impact on Alcoa's ability to drive positive social outcomes.

As safety manager for our Brazil operations, Heitor and his team developed an innovative training program called Elite Safety Technicians. It helps support Alcoa's safety professionals in learning, connecting and delivering stronger safety performance.

"Most safety programs are focusing on top and line leaders, but this program helps impact another level that's equally important in the organization," Heitor said. "While many of the safety technicians aren't in a direct leadership role, they have lots of influence."

To create this completely custom program, the team surveyed a cross section of employees and contractors to identify training gaps. The inaugural program comprised separate, two-hour sessions on safety and Alcoa's business strategy, influence and leadership interpersonal skills, electrical safety standards, Human Performance, and critical risk management.

In 2021, the first cohort of more than 150 employee and contractor safety technicians from across our three locations in Brazil participated in the program. Nearly half had less than two years of experience at an Alcoa facility.

"This program is bringing all of us together," said participant Darlene Oliveira, safety technician for Alcoa contractor CONSEL. "Over the years, I accumulated a lot of experience, but it's always refreshing to hear and learn from other colleagues. This helped us acknowledge the challenges we all have and makes me feel more prepared to deal with similar situations."

Our Brazil locations will offer an expanded program in 2022.

Health

Our health vision is to prevent occupational disease through our exposure controls, support personal health and well-being through our workplaces and culture, and operate in a manner that does not negatively impact the health of our communities.

A four-pillar health framework, with overlapping and synergistic elements, guides our strategies and tactics toward achieving this vision:

- 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 our social license to operate
- Personal health and well-being

Further guiding our efforts are our internal global health standards that often are more stringent than those specified by applicable law. We also proactively identify and respond to emerging health-related trends in our industry, and we have long-standing participation with the Health Committee of the [International Aluminium Institute](#).

HEALTH HAZARD CONTROLS

The health hazards inherent in our operations may include chemical, physical (noise, ergonomic, radiation, heat and vibration), biological and other types of hazards. Our locations have spent decades implementing processes, procedures, equipment and technologies to mitigate these risks and have made significant progress.

With support and direction from our internal Health Center of Excellence (CoE), our locations continuously strive to further eliminate or reduce hazardous exposures in adherence to the hierarchy of control principles.

Despite resources and focus being diverted to address the ongoing COVID-19 pandemic, we achieved the following progress on key initiatives during 2021:

- Implemented efforts to comply with the requirements of our 2020 updated global Heat Stress Management Standard, particularly quantitative exposure assessment at all locations and physiological monitoring trials at select high-risk smelters
- Following the classification of welding fumes as carcinogenic to humans by the International Agency for Research on Cancer, implemented control projects for welding fumes, especially engineering controls to reduce welders' exposure

- Rolled out a cross-functional global Good Work Design initiative to enable diversity, increase job satisfaction and reduce injuries
- Created an emerging infectious disease critical risk assessment and risk control bowtie analysis that identify preventive and mitigating controls against the potential occurrence of disease outbreaks—local, regional or global—that could impact personnel and operations
- Implemented efforts to close gaps against the requirements of the 2020 revised global Hazardous Materials Management standard, particularly a reconciliation of location-based materials inventories against our enterprise-wide procurement database
- Achieved ongoing incremental progress in identifying and controlling noise and chemical exposures

We will continue our work in these areas throughout 2022.

Communication on health hazards is a centerpiece of our health management strategy, which aligns with our company values and compels us to inform our employees and contractors of the hazards and risks that they may encounter in the performance of their daily work.

Where appropriate, industrial hygiene exposure data that we collect is readily shared with our contractor companies, giving them the information needed to implement controls for their personnel. This is often a collaborative exercise, with Alcoa providing guidance as warranted and specified by local regulations.

The quality of our industrial hygiene program, which underpins the health hazard control area, is assured by our comprehensive Industrial Hygiene Standard. Among other things, this standard specifies that every operating location has a qualified industrial hygiene professional or consultant who has explicit education and certification credentials. This person is responsible for the supervision and technical support of the location's industrial hygiene activities. Corporate and regional industrial hygiene managers further support and guide these activities.

HEALTH STATUS AND FITNESS FOR WORK

Our focus within this pillar is on addressing the ability of employees to safely perform their assigned work activities. This is enabled by our occupational medicine services, fatigue and shift work practices, substance use and abuse programs, worker's compensation management, rehabilitation and return-to-work approach, and emergency medical response capabilities.

All employees have access to occupational medicine services, most of which are delivered through on-site medical departments due to the relatively large size and risk profile of our locations. These services include:

- Regulatory or Alcoa-driven risk-based chemical surveillance evaluation
- Fitness-for-duty (inclusive of return-to-work) assessment with associated rehabilitation consultation and job placement support, as appropriate
- Hearing evaluation
- Lung-function testing
- Work-related injury and illness evaluation and treatment
- Substance use and abuse testing
- Job-related immunizations

Two of our global occupational health standards govern the quality, competency and confidentiality/privacy of these programs. Our Occupational Healthcare Services Standard outlines requirements for on-site and community occupational health facilities, the professionals delivering these services, medical laboratories and spirometry testing. Our Management of Employee Medical and Exposure Records Standard defines the custody, control, access and retention of private health information.



We also conform to applicable country-specific and local data privacy regulations, such as the Health Insurance Portability and Accountability Act (U.S.) and the Global Data Protection Regulation (European Union).

Throughout 2021, we continued our measured implementation of our process-based medical evaluation model according to location readiness. Despite the challenges of the COVID-19 pandemic, more than three quarters of our global locations deployed this efficiency and optimization model by the end of the year.

Fatigue risk management continued to progress in 2021, as our locations worked to close gaps against our global Fatigue Risk Management Standard. Our multi-module library of fatigue risk management education materials was a focal point throughout the year. We also conducted shift work roster assessments at our Australian mining operations as well as several other high-risk operating locations to identify and implement adjustments that would favorably impact fatigue risk.

Several of our Brazilian operating locations have deployed pre-shift generic impairment screening as part of their comprehensive fatigue risk management strategy. This technology is planned for further trials in other regions in 2022.

Community and Public Health

Our community and public health initiatives require us to be attuned to the interests and needs of the communities in which we operate against the backdrop of local or national regulatory obligations.

We continuously monitor the occurrence of disease outbreaks and emerging infectious diseases in proximity to our operating locations to offer support and guidance in risk avoidance to our local medical and health professionals, as well as expatriates and business travelers.

During 2021, we helped shape a project focused on the health impacts of global climate change that will be delivered under the auspices of the International Aluminium Institute. The outputs will be available in 2022.

Other focus areas within this pillar of our health framework include product stewardship, the European Union's [REACH regulation](#), our safety data sheet authorship and management system, and response to customer and consumer concerns related to our products and public health. Our locations also invest in programs and initiatives aimed at improving individual health and wellness in the communities in which they operate.

Personal Health and Well-being

Voluntary programs focused on personal health and well-being and health promotion among our employees originate at the regional and location level. These can include biometric screenings, nutrition programs, wellness competitions and more.

In the U.S., for example, the incentivized Healthy Rewards Program includes biometric screenings, online prevention options, preventive cancer screenings, health coaching, telemedicine and more. Coordinated by a third-party administrator, the program motivates our employees toward improved personal health.

The well-being of our employees is enhanced by many of our existing health initiatives. Examples include location-based employee assistance programs, traveler and expatriate health, safety and security, return-to-work programs and fatigue risk management. The holistic nature of the latter highlights the intersection of occupational health and personal well-being.

Mental health remained a strong focus in 2021 due to the uncertainty and dynamic nature of the COVID-19 pandemic, our continuing work-from-home policy for appropriate personnel, travel and gathering restrictions, and the "pandemic fatigue" that was experienced individually and collectively.



In October, we again participated in the World Health Organization's World Mental Health Day. We also provided additional mental health resources, communications, self-help materials and more to our workforce.

We facilitate access to non-occupational medical and healthcare services for our employees. This is aligned with governmental regulations, the availability and quality of local healthcare infrastructure systems, provider availability, negotiated labor contract provisions, customs, contractor agreement specifications, demographics and other considerations.

Some of our locations are situated in countries or regions with high-quality local healthcare systems. Other locations and personnel have unique needs requiring creative, even visionary, solutions.

For example, the non-occupational healthcare needs of expatriate employees and their family members are established locally through a careful and thorough due diligence process. At our mining operation in Juruti, Brazil, we were instrumental in establishing a new community hospital in the early days of the operation. This hospital served a vital role in the COVID-19 pandemic.

We require all locations globally to establish emergency medical response capability and services for both occupational and non-occupational needs. These services are provided through on-site or community resources with the ability to respond promptly.



Supply Chain

8 DECENT WORK AND ECONOMIC GROWTH



11 SUSTAINABLE CITIES AND COMMUNITIES



17 PARTNERSHIPS FOR THE GOALS



10 STAKEHOLDER ENGAGEMENT



Our sustainability approach covers the entire life cycle of a product, so we seek suppliers that share our commitment to sustainability. This is included in our [Supplier Standards](#), which are an integral part of doing business with Alcoa.

Responsible Sourcing

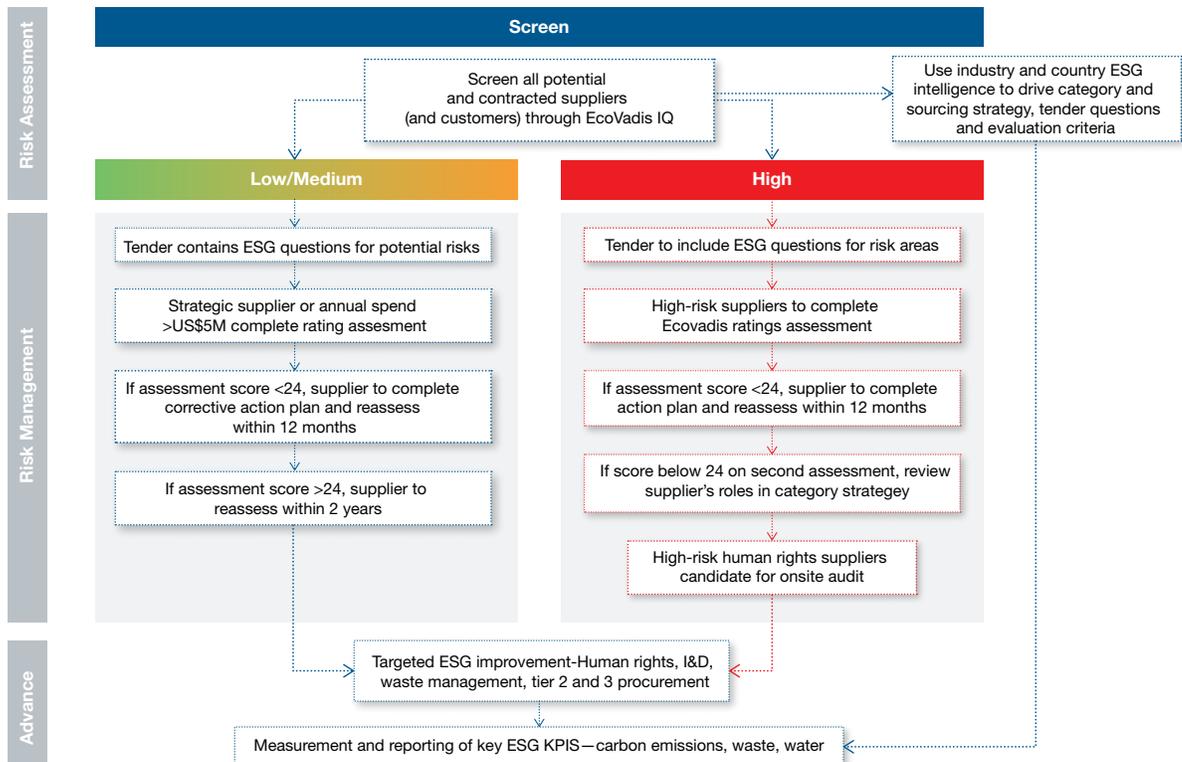
As part of our approach to responsible sourcing, we identify, integrate and manage ESG requirements and risks (including human rights) into our procurement practices and supplier management. Through a suite of ESG intelligence providers and a digital library integrated in our enterprise resource planning (ERP) system, ESG becomes part of our category strategies, supplier tenders, supplier selection process, contract Key Performance Indicators (KPIs), supplier performance management and monitoring.

In 2021, we expanded the program to include ESG risk screening of our entire supply base, integrating a risk-based decision criteria to determine where suppliers require further assessment, monitoring, or audit.

Our responsible sourcing approach is supported by the following KPIs:

- ESG risk screening of all of our suppliers and business partners
- Further due diligence through assessment of all high-risk suppliers
- Percentage of suppliers improving their ESG maturity rating year on year
- An average Alcoa supplier ESG maturity rating compared to the EcoVadis benchmark

SUPPLIER ESG RISK DECISION TREE



SUPPLIER SUSTAINABILITY PROGRAM

Our Supplier Sustainability Program works to ensure our Values are incorporated into our supply chain. It also provides due diligence of, and insight into, the ESG performance of key suppliers and a framework to work with them to advance sustainably.

The program consists of a three-component framework: assess, audit and advance.

Assess

Our suppliers are screened and assessed through our three program partners:

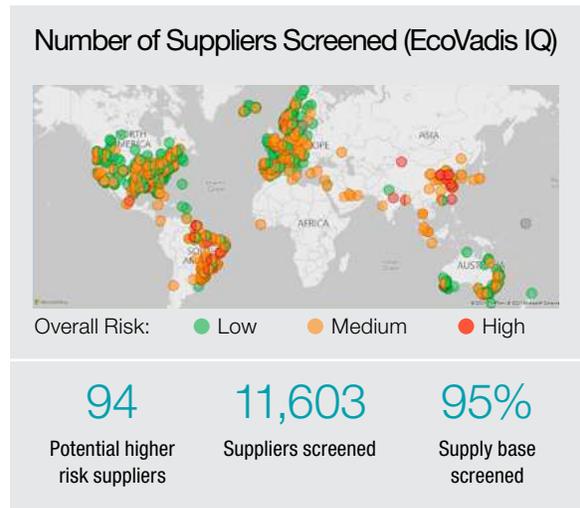
- **EcoVadis:** We use the EcoVadis IQ platform to screen all suppliers, including potential suppliers, for ESG risk. The screening process combines a supplier's industry, countries of operation and key procurement data, such as criticality of supply, to determine if overall ESG risk is high, medium or low. Key ESG intelligence for each supplier's industry and countries of operation is leveraged into our tendering, contracting and supplier management process.
- **Descartes MK Denied Party Screening:** Potential suppliers and signatories are screened for an appearance on the United States Denied Parties List. Any supplier on the U.S. Denied Parties List is denied from working with Alcoa.
- **Trace International TRAC Program:** We engage with Trace International to support our due-diligence program and further manage risk in our supply chain related to bribery and corruption, trade compliance, child and slave labor, criminal history, human trafficking and conflict minerals. TRAC screens suppliers against watch lists and for international sanctions, criminal acts and bankruptcy. This program assesses suppliers with an Alcoa spend greater than US\$50,000 per year that are based in a high-risk country, as well as those with an Alcoa spend above US\$1 million per year but are not based in a high-risk country.

ECOVADIS IQ VENDORS BY OVERALL RISK

Audit

Suppliers with an overall ESG risk rating of high, strategic suppliers and higher-spend suppliers are all required to complete further due diligence by undertaking an audit that uses the EcoVadis Ratings Assessment. Should a supplier already be audited by an equivalent third-party ESG ratings provider, the supplier may provide that assessment report for review by our senior manager of responsible sourcing.

The EcoVadis Ratings Assessment audits our suppliers and associated supply chain against 22 criteria covering environment, labor and human rights (including modern slavery), ethics, and sustainable procurement tailored to that supplier's industry and countries of operation.



SUPPLIER ASSESSMENT CRITERIA



Environment

- Energy consumption and greenhouse gases
- Water
- Biodiversity
- Local and accidental pollution
- Materials, chemicals and waste
- Product use
- Product end-of-life
- Customer health and safety
- Environmental services and advocacy



Labor and Human Rights

- Employee health and safety
- Working conditions
- Social dialogue
- Career management and training
- Child labor, forced labor and human trafficking
- Diversity, discrimination and harassment
- External stakeholder human rights



Ethics

- Corruption
- Anticompetitive practices
- Responsible information management



Sustainable Procurement

- Supplier environmental practices
- Supplier social practices

The EcoVadis Ratings Assessment covers a supplier's policies, third-party endorsements and certifications, measures and actions, reporting and [EcoVadis 360° Watch](#) findings to rate the supplier's ESG performance maturity from zero to 100. Because EcoVadis is a third-party solution, suppliers share results with not only Alcoa but other customers.

Alcoa sets a threshold maturity rating of 24 for our suppliers. Should a supplier score below 24, we require that supplier to complete a corrective action plan and undertake reassessment within 12 months.

The EcoVadis assessment platform provides all suppliers with an actionable scorecard. Each element is given a priority rating and is accompanied with coaching and guidance to assist suppliers on the improvement journey.

In-field verifications enable us to confirm ESG implementation and provide increased transparency to ensure our suppliers are delivering on their commitments and conduct.

With access to supplier locations limited due to health and safety measures to manage COVID-19 in 2021, we developed decision-making criteria and data analytics to determine which segments of our supply chain would benefit most from further assessment.

Our continued participation in the Human Rights Resources and Energy Collaborative saw the development of a cross-industry remedy approach to support the remediation of people identified as being affected by modern slavery. The collaborative is a cross-industry working group formed to network and share knowledge on human rights, including the implementation of the Australian Modern Slavery Act (2018).

Working with EcoVadis, we can segment a supplier's audit results to specifically review its performance and maturity across the human rights criteria. Our focus for 2022 is to advance our approach by developing a protocol and further exploring in-field verifications.



Advance

We work to advance the ESG performance of our suppliers through the EcoVadis assessment platform. Along with their assessment scorecard, suppliers are provided feedback on improvement areas. This feedback and guidance are used to create improvement plans, set key performance objectives and develop strategic partnerships to manage risk and create long-term value.

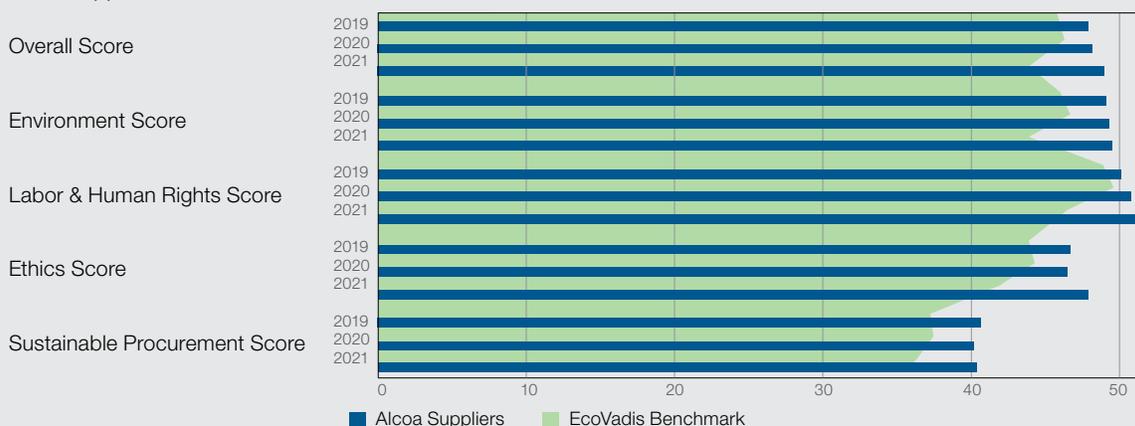
In 2021, EcoVadis introduced the [EcoVadis Academy](#). This eLearning platform gives organizations guidance to address priority improvement areas across environment, labor and human rights, ethics and sustainable procurement practices.

2021 Performance

In 2021, we assessed more than 11,600 suppliers (95 percent of our global supply base). Of these, 94 were identified as higher risk requiring further due diligence by undertaking the EcoVadis Ratings Assessment Audit. More than 800 suppliers completed further assessment (39 percent of our supply spend), with less than 45% being a first-time assessment. Of the suppliers undertaking reassessment 63% improved their score. 98 percent of assessed suppliers met our minimum requirements. The average overall score was 48.1, which is 10 percent above the EcoVadis benchmark (43.7).

Year on Year Performance

Alcoa Suppliers vs. EcoVadis Benchmark

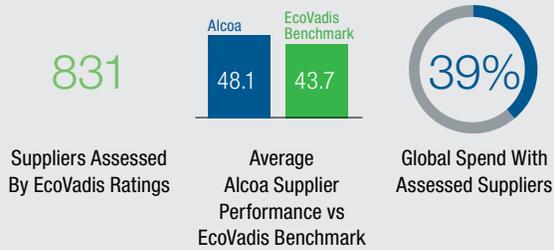


Performance Over Time

	2019	2020	2021
% of Spend Assessed	31%	31%	100%*
% of Spend Completed EcoVadis Ratings Audit	43%	43%	39%
% of Re-assessed Supplier Who Improved Their EcoVadis Ratings Score	60%	61%	63%
Number of suppliers assessed in program	649	748	11,603

*Implementation of EcoVadis IQ, all suppliers and potential suppliers are assessed through EcoVadis IQ

Suppliers Assessed by EcoVadis Ratings and Benchmarking



2021 Local Spend – Regional Detail

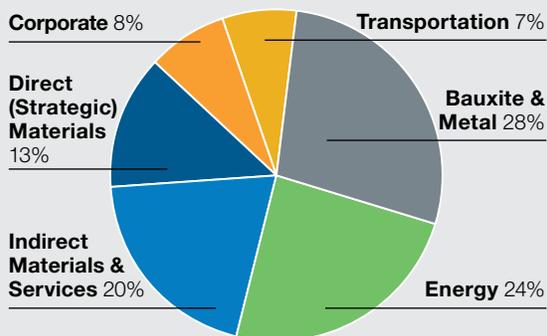
Region	Locality Bucket	Spend (USD)
Australia	Local	\$735,230,876
	Non-Local	\$313,374,385
Europe	Local	\$360,522,601
	Non-Local	\$1,061,670,742
North America	Local	\$1,111,796,912
	Non-Local	\$1,138,992,560
South America	Local	\$918,368,385
	Non-Local	\$216,885,095

2021 Spend by Region

Region	Supply Chain Spend (Billions of U.S. dollars)	Supply Base Composition (Percent of Total Supply Base)
Australia	2.15	19
Europe	2.8	25
North America	4.9	44
South America	1.3	12

2021 Top Spend by Commodity

(Billions of U.S. dollars)



Total spend \$11.15bn

SUPPLY CHAIN SPEND

In 2021, we purchased US\$11.15 billion in goods and services from thousands of suppliers around the world.

SUPPLY CHAIN INCLUSION AND DIVERSITY

In 2021, we launched our Supply Chain Inclusion and Diversity Strategy to create and support a supply chain that reflects the diversity of the communities in which we (Alcoa) operate. The strategy works to build awareness, both internally and externally, of the benefits of a more inclusive and diverse supply chain through our Supplier Standards, spend analytics and first global Supplier Inclusion and Diversity Survey.

Coordinated with the release of our updated Supplier Standards, the survey asked suppliers about their own approaches to inclusion and diversity, including policies and programs, and to voluntarily disclose the diversity of their ownership structure and internal workforce. We analyzed the survey results to determine trends and opportunities based upon global operating regions and supplier commodity.

We place a strong value on achieving a supply chain that reflects the communities in which we operate. We use the term diversity to acknowledge underrepresented peoples applicable to our supply chain, including Indigenous and other Land-Connected Peoples, women, veterans, people with disabilities, LGBTQ+ and other minorities.

In addition to increasing awareness, we are educating our suppliers on inclusion and diversity. This effort is supported by our Global Supplier Sustainability Program, our supplier relationship management approach, our work with suppliers to complete their EcoVadis improvement plans and the EcoVadis Academy learning opportunities.

The strategy incentivizes supplier performance through the addition of standardized inclusion and diversity questions as part of our tendering process and supplier evaluation criteria. The strategy also seeks to develop regional partnerships focused on supporting and developing diverse suppliers to improve their ability to compete in the supply chain.

To support local spend, we developed our Local and Indigenous Procurement Policy for the Australian region in 2020. We expanded this with a South American Policy in 2021. These policies provide guidance on

what defines a local supplier and our acknowledgement and commitment to the Traditional Owners of the land on which our operations are located in accordance with Alcoa's [Indigenous Peoples Policy](#) and Australian [Reconciliation Action Plan](#).

To increase our spend with suppliers near our facilities, we developed a procurement tool that allows us to track local spend not only by amount but also by the proximity of suppliers to the Alcoa shipping address. The latter data is categorized by number of shipments to the same city, same state (United States only), same country and non-local (outside of the country in which the Alcoa facility is located).

This localized data allows us to identify opportunities to increase our spend with local suppliers and also helps us analyze the environmental impact of transporting products from suppliers to our facilities.



Australia Key Actions

In Australia, our operations are located on Noongar, Guditjmarra and Wadawurrung lands. To support our local procurement team's efforts to identify and work with the Indigenous Peoples of these lands, we launched a partnership with Supply Nation in 2021. Supply Nation is a leading database of verified Indigenous business. Along with ownership registration and certification services, Supply Nation supports Indigenous businesses through training programs.

In conjunction with the Alcoa Foundation, we initiated a partnership with [Waalitj Hub](#) in Western Australia to deliver business engagement, coaching and support to Aboriginal businesses through hubs across the Pinjarra, Bunbury and Kwinana regions supporting our locations. The organization is part of the Wirrpanda Foundation.

South America Key Actions

In the Brazilian state of Maranhão, where our Alumar refinery is located, we are a member of the Federation of Industries of the State of Maranhão (FIEMA). As part of its economic development activities, the organization facilitates member access to local suppliers and works to develop the local supplier base.

To further increase our spend with local suppliers in Brazil, we have an online marketplace called Alcoa Buy for maintenance, repair and operations non-inventory products. The marketplace hosts the product catalogs of local suppliers, increasing their visibility and facilitating purchases with them. Onboarding to Alcoa Buy is supported by workshops, conferences and individual meetings with local suppliers.

Our Juruti mine and Alumar refinery made 71 percent of their non-inventoried goods purchases through Alcoa Buy in 2021.

Regional Partnerships—Australia



- Previously named Wirra Hub
- 9 community engagement hubs across 18 months
- Building community connection between Alcoa and our operating regions
- Connecting Indigenous businesses with free coaching and business improvement to drive tender participation and performance support



- Australia-wide network of Indigenous business, with certified 51% Indigenous ownership



SUPPLY CHAIN HUMAN RIGHTS

Understanding and assessing our supply chain is key to ensuring that we are not directly or indirectly (through subcontractors) contributing to modern slavery and other human rights violations.

While we are required to report and progress against identifying and remedying modern slavery in our supply chain in some operating jurisdictions, we choose to take a consistent, global approach, identifying and addressing potential human rights risks in our supply chain.

Our Supplier Sustainability Program includes assessing a supplier's policies, procedures, commitments, endorsements and results related to:

- Slavery
- Child labor
- Human trafficking
- Code of conduct
- Migrant worker policy
- Recruitment policies
- Access to remedy policies
- Key performance indicators
- Grievance mechanisms
- Collaboration with nongovernmental organizations
- Human rights impacts and risk assessments
- Procurement social practices
- Supply chain risk mapping

Our audits through the Supplier Sustainability Program are industry specific, recognizing that industries such as recruitment, manufacturing, transport, construction, mining, agriculture and facilities management present a higher human rights risk.

We incorporate audit results into our advanced analytics to identify where categories of spend or even specific suppliers have key gaps in their approach to human rights. Through our category and supplier management

approach and the resources of the EcoVadis Ratings Assessment, we work with suppliers to address gaps, increase transparency and re-assess.

Suppliers are also continuously monitored through the EcoVadis 360° Watch program for positive and adverse media and sanction listing changes. Media monitoring provides key leading indicator insights into supplier performance across its supply chain.



Waalitj Hub Business Coach Robert Barton presenting to Indigenous businesses at the Bunbury Waalitj Hub in August. The program assists with business capacity building and local procurement opportunities supported by the Alcoa Foundation. Photo courtesy of Waalitj Foundation.

Related Information

[Supplier Standards](#)

[Ethics and Compliance](#)

[Human Rights Policy](#)

[Alcoa of Australia Modern Slavery Statement 2020](#)



Facility Stewardship and Transformation

15 LIFE ON LAND

7 CONSERVATION OF BIODIVERSITY

10 STAKEHOLDER ENGAGEMENT



Eden Project Anglesea's Water Concept is a wondrous centerpiece rising from the waterbody and is part of the sustainable transformation of Alcoa's former Anglesea site.



When we make the difficult decision to permanently close a facility, we work closely with relevant stakeholders to develop a post-operation strategy to optimize the land and assets so they can potentially be reused or redeveloped, generating jobs and a tax base for the community. Some facilities can be repurposed with few changes. Others may require remediation, major modification or demolition.

To ensure the Company applies this approach consistently, our global Transformation Group oversees all real estate and manages all closed or curtailed operations. It also has responsibility for managing any environmental liabilities at our operating and non-operating locations and ensuring that appropriate accounting reserves are established and updated, as necessary.

The Group maintains an estimate of closure scope and costs for each operating location under various scenarios. These estimates consider input from known stakeholders who are periodically engaged as part of our outreach programs. They are also a key participant in the review of our operating portfolio, to ensure that this input is included in any assessment of potential closure or curtailment scenarios.

In 2021, we spent US\$118 million on stewardship and transformation projects at 41 locations around the world. Many projects were at non-operating locations once operated by Alcoa, its subsidiaries, or a predecessor. The remaining projects were at operating locations or divested facilities with retained environmental responsibility.

While COVID-19 restrictions continued to impact fieldwork in 2021, our employees and contractors were still able to progress toward our milestones.

2021 Transformation Spend

Activity	Spend
Mine Reclamation	37
Demolition at Closed Locations	24
Environmental Remediation	24
Closure of Bauxite Residue Areas at Closed Locations	29
Landfill Closure	4
Total	118

*Millions of U.S. dollars
Includes reserve and expense spend*

We are a founding member of the Surplus Property Roundtable, furthering our influence and learning in facility management. This group of senior leaders from Fortune 100 and leading non-profit organizations establishes best practices for responsibly managing surplus properties. The organization's goals focus returning properties to productive use, eliminating blight, creating new tax revenues and jobs, reusing existing infrastructure and sustainably preserving natural resources.

Alcoa Foundation also plays an important role in helping community organizations after a closure or curtailment via charitable donations to qualifying non-profit organizations. In 2021, the Foundation provided nearly US\$540,000 in support for education and community enhancement at closed facilities now managed by the global Transformation team.

“I am pleased that the former Eastalco property will once again serve as an employment center with high-paying jobs. Quantum Loophole has committed to develop an environmentally-sensitive data center project that respects and values the surrounding community and our Livable Frederick Master Plan. Data centers provide a stable source of tax revenue and jobs while having a net positive impact on local services, such as schools, roads and other infrastructure.”

Jan Gardner

Frederick County Executive

Remediation Approach

We work to adapt our practices as technologies and science advances. Some historical practices may have been performed without today's expert knowledge. While legal and appropriate at one time, some historical sites require remediation to be repurposed for the benefit of local communities.

The protection of human health and the environment are always the overarching objective of any remediation project we undertake. First, we use scientific methods to assess the environmental conditions and then identify remedial solutions that are protective, compliant, feasible and compatible with current or likely future uses of the facility. This requires balancing multiple internal and external needs, desires and expectations while keeping good science and feasibility as key drivers in selecting a remedial approach.

Facility Repurposing

In 2021, we successfully transitioned 3 locations totaling 13,438 hectares (33,207 acres) to end users and developers who plan on investing billions of dollars in these locations and their communities. We also made substantial progress on the restoration of several other sites.

In the second quarter of 2021, we closed on the sale of the 890 hectare (2,200 acre) former Eastalco smelter site in Frederick Maryland (USA) to a new owner (Quantum Loophole) who plans to invest several billion dollars to create the largest sustainable data center campus on the East Coast of the United States. We worked with the Maryland Department of the Environment to remediate the location and established an ecological easement that allowed for industrial redevelopment. Quantum Loophole will also sustainably use the location's extensive existing utility infrastructure and power line easements to accelerate development and delivery of its facilities.

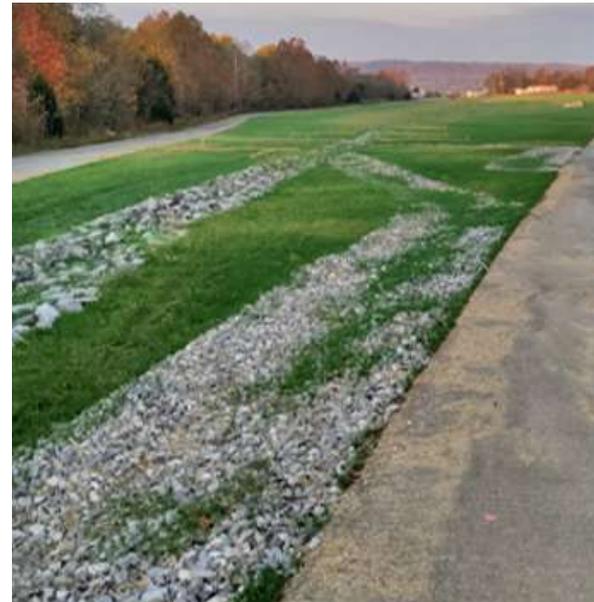
At our former 33,000-acre smelter in Rockdale, Texas (USA), we achieved our goal of positioning the location and its assets for redevelopment. In the third quarter of 2021, we sold the location to a Texas-based developer that will continue to build out additional industrial and mixed-use spaces, providing new jobs and an improved tax base for the local community.

In 2019, we positioned the property for sustainable reuse by removing the aluminum smelting equipment. We will demolish various ancillary facilities in 2022 and complete demolition and environmental remediation activities by 2024.

We leased several former potroom buildings at the Rockdale site to a technology company that has installed blockchain infrastructure. Another blockchain computing company that leases land at the site constructed new buildings and began installing equipment during 2020. Both companies are taking advantage of the location's extensive electrical infrastructure. Collectively, they are employing approximately 230 direct hires, almost all of which were locally sourced. The leases transferred to the new owner.

The Rockdale location is poised to support and participate in the massive growth of the greater Austin area. In 2021, prior to selling the site, we were successful in securing export permits for our significant groundwater resources. This groundwater will be a key enabler for the substantial growth planned for the communities surrounding the northern Austin, Texas area.

In the fourth quarter of 2021, we sold our former bauxite and alumina shipping terminal in Trinidad and Tobago. The new owner will convert the facility into a shore base that supports the oil and gas industry in the southern Caribbean Sea. We worked with the new owner for two years to modify the terms of the aquatics lease and expand the types of work and employment that could be performed there.



The Caseyville Dock site before (left) and after remediation (right).

In Badin, North Carolina (USA), we worked with a manufacturing company to rehabilitate our former 6,410-square-meter (69,000-square-foot) machine shop for that company's new manufacturing plant. Under a 20-year lease, the company plans to hire approximately 40 employees from the surrounding communities.

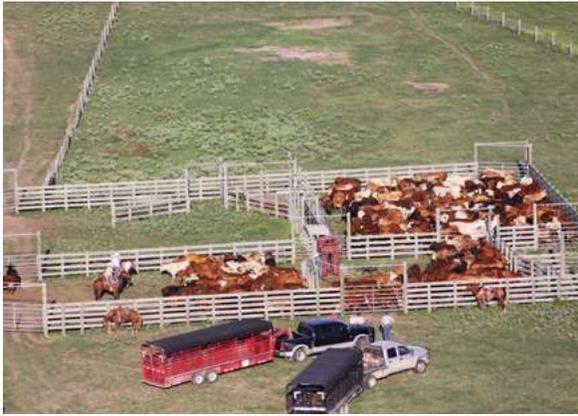
The Caseyville Dock site in Sturgis, Kentucky (USA) was a former coal-staging and river-barge loading facility. The approximately 5-hectare (12-acre) coal-staging area was unvegetated and littered with refuse coal, various process equipment and other debris from the previous owner and operator. The site's stormwater runoff had a low pH level and was laden with metals from contact with the refuse materials. The stormwater required constant treatment to achieve compliance with permitted water quality discharge limitations, and it had corroded much of the storm-sewer piping.

In 2021, we used a novel mobile screening and density separation process to segregate coal from soils, aggregates, organics and other waste materials to

remediate the site. As a result, we recovered 2,500 metric tons of coal and transported it offsite for reuse. We also recycled 105 metric tons of scrap metal and repurposed approximately 750 metric tons of stone on site. We used the remaining inert materials to achieve a desired grade to promote proper site drainage and establish a vegetative cover. We also rebuilt and improved the storm-sewer piping and outfall structures.

These comprehensive site improvements have resulted in a significant improvement in water quality. The pH is neutral, and all constituents are well below permit limitation concentrations without treatment.

In Victoria, Australia, we continued decommissioning and remediating the 575-hectare (1,421-acre) Point Henry complex, which closed in 2014. More than 95 percent of the physical structures had been removed and recycled by the end of 2020, with the remaining structures positioned to be repurposed during redevelopment. We worked in accordance with the auditor approved by the Environment Protection Authority Victoria to progressively



CE Ranch has expanded its cattle herd size, replaced and improved perimeter fencing, and continued to harvest hay fields on the approximately 5,000 acres used for grazing and hay production.

develop and implement remediation action plans for the site. Remediation work began in 2020 and is expected to be completed in 2024.

We also continued to work with the Victorian and local governments on the long-term land use of the site. The Point Henry 575 Concept Master Plan envisions a mixed-use redevelopment with numerous types of residential, commercial and recreational subdivisions.

At our former 150-megawatt coal-fired power station in Anglesea, Australia, which closed in 2015, we substantially completed the grading and reclamation of the open pit coal mine. The major earthworks program encompassed the cut and fill of more than 3 million cubic meters (nearly 4 million cubic yards) of topsoil and overburden and included the relocation and reconstruction of a public road. We also completed the hydroseeding of 53 hectares (131 acres) of native grasslands on the mine slopes, and we initiated a maintenance and monitoring program to ensure the landform is safe, stable and sustainable. ([View a video](#) on the rehabilitation process.)

For the sixth consecutive year, the Victorian Department of Environment, Land, Water and Planning (DELWP) harvested winter water flows from the Anglesea River and stored the water in one of the Anglesea site's former ash ponds. DELWP distributed this water as needed over the summer to maintain the river's flow to mitigate impacts from naturally occurring acid soil within the adjacent national park.

In Suriname, we continued our work with the government of Suriname under the agreed-upon scope and standards to remediate legacy environmental issues, close mines and decommission the former alumina refinery.

We completed the following significant milestones in 2021:

- Continued the closure of bauxite residue areas
- Completed approximately 50% of plant demolition
- Rehabilitated 170 hectares (297 acres) of mine lands

At the closed Massena East smelter in New York (USA), we continued working with the St. Lawrence Regional Development Authority and the New York Power Authority (NYPA) to help market the site to potential businesses. A data management firm leases our former smelter buildings to operate a blockchain computing center at the site. This reuse employed approximately 100 full-time people in 2021 and still has capacity to grow.

Following our 2019 announcement of the closure of the Point Comfort refinery, we began work in 2020 and made considerable progress in 2021. We continue to create space for new industry and identify opportunities for further investment at this location. We have developed conceptual plans to close the four bauxite residue disposal areas in accordance with the requirements of the Texas Commission on Environmental Quality. We continue to operate a groundwater collection system adjacent to one of the areas to control impacted subsurface groundwater.

Operating Facilities

In Lake Charles, Louisiana (USA), we completed the remediation of subsurface soils impacted by prior site operations. We also closed hazardous waste landfills at our smelter operation in Mosjøen, Norway.

Environmental Responsibilities

At closed U.S. bauxite residue storage areas in Arkansas, Alabama, Illinois and Texas, we maintained stormwater

conveyance channels, monitored and maintained the vegetative cover, and repaired access roads and other erosion-impacted features in accordance with regulations.

We have negotiated a consent decree with the U.S. Environmental Protection Agency for the remedial design/remedial action of industrial and residential properties surrounding our closed bauxite residue disposal area in East St. Louis, Illinois. Design work will continue in 2022, with subsequent remedial action through 2023.

We continued our management of bauxite residue at a residue storage facility, known as the Copano Beds, near Corpus Christi, Texas that operates in full compliance with our negotiated agreement with the Texas Commission on Environmental Quality (TCEQ).

Alcoa Corporation never operated the Copano Beds, but we are managing the site through one of our subsidiary companies after Sherwin Alumina Company, a prior operator, declared bankruptcy in 2016. The site's environmental liabilities then reverted to Alcoa Inc. due to its 2000 acquisition of Reynolds Metals Company, the original owner and operator. Since Alcoa's subsidiary has taken over management of the site, all environmental standards have been met, and we continue to work with TCEQ and various community stakeholders to demonstrate best practices for managing bauxite residue.

The Copano facility comprises 4,480 hectares (11,070 acres) of land, including 1,355 hectares (3,349 acres) of residue storage areas made up of four beds. We have developed and shared with the TCEQ conceptual plans to recondition the surface layer of one of the beds to support a vegetative cover. Detailed closure planning and implementation will occur over the next several years.

In partnership with the local cotton industry, we continue to implement a mutually beneficial and sustainable plan where we use that industry's ginning waste to support conditions for the vegetative cover. The material, which is combined with woody mulch and gypsum into the surface layer of the bauxite residue, will hasten the permanent closure of the beds, which will include the vegetative cover, while also eliminating the need to landfill ginning waste.

Sustainable Land Use

We seek and support sustainable uses for our large land holdings, some of which provide a buffer for our operations and others that contain mineral reserves that can be extracted over time.

FARMING

We lease 5,999.15 hectares (14,824.22 acres) of our land at ten locations for farming. At our closed Eastalco location, for example, we leased 434 hectares (1,072 acres) of land to the same family for more than 15 years for farming corn and other crops. We transferred the lease to the site's new owner in 2021.

Other farming operations produce apples, cherries, corn, hay and soybeans.

In Addy, Washington (USA), we grow alfalfa that the Washington Department of Fish and Wildlife harvests for the winter feeding of 7,000 elk and 200 bighorn sheep. We have grown and donated more than 900 metric tons of alfalfa annually since 2008.

LIVESTOCK

At our Warrick Operations in Indiana and the closed operations in Rockdale, independent farmers maintain herds of hundreds of cattle. At the Copano property, we own and maintain approximately 380 head of cattle. A small herd of cattle is also kept at our property in Blount County, Tennessee. At our Wagerup and Pinjarra refinery operations in Western Australia, our buffer lands are used to graze more than 8,500 head of cattle.

MINERAL MINING

At some locations, we have other mineral resources in addition to the coal or smelter-quality bauxite for which the lands were obtained. We work with third-party consultants and miners to evaluate and sustainably mine these resources.

In Bauxite, Arkansas (USA), we have active mining leases for both hard rock and bauxite on our retained lands. The materials are sold primarily into the construction and cement industries.

WATER

At a number of locations, we hold significant water rights that benefit not only our operations but also the community. Where we have dams, we proactively work to manage water and reservoir levels to enable recreation and fishing.

Biodiversity and Mine Rehabilitation

6 CLEAN WATER AND SANITATION



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



13 CLIMATE ACTION



14 LIFE BELOW WATER



15 LIFE ON LAND



4 RISK MANAGEMENT



6 ENVIRONMENTAL PERFORMANCE



7 CONSERVATION OF BIODIVERSITY





We operate in a manner that aims to minimize our environmental impact and promote sustainable land use. We are also working toward no net loss of biodiversity for new sites and major expansion projects.

Biodiversity

We endorse biodiversity conservation and we are committed to the mitigation hierarchy of avoidance, minimization, restoration and offsets during the lifecycle stages of our operations.

We respect legally designated protected areas, such as national parks and nature reserves, where strict nature conservation is the management objective. We have also committed not to explore, mine or operate in [World Heritage sites](#) and to avoid developing new operations within protected areas under International Union for Conservation of Nature (IUCN) categories I, II or III.

Prior to commencing new construction projects or significantly expanding existing facilities, we conduct an environmental assessment to identify any potential impacts to biodiversity. This assessment uses techniques, procedures and information generally accepted by the international scientific community as leading practices.

Our comprehensive approach allows operations and biodiversity conservation to coexist. We have successfully operated bauxite mines, alumina refineries and aluminum smelters in areas of high biodiversity. When areas are disturbed by bauxite mining, we progressively rehabilitate the land to mitigate impacts and return it to an agreed post-mining land use. In areas of significant biodiversity values, we aim to rehabilitate the land to a future use that reinstates those biodiversity values.

Our [Biodiversity Policy](#) encapsulates the requirements set out in our corporate Biodiversity Standard. The standard requires each site to conduct an assessment, identify material risks to biodiversity and implement a biodiversity action plan to manage these risks. For new sites and major expansions of existing sites, the standard sets an ambition of achieving no net loss of biodiversity. As a member of the International Council on Mining and Metals (ICMM), our biodiversity standards and practices are in line with the requirements of the organization's 10 Principles and associated Performance Expectations.

In 2021, we updated our Biodiversity Policy to reflect our commitment to contribute to the collective efforts to halt deforestation globally.

In March 2021, through a partnership with Alcoa Foundation, the International Union for Conservation of Nature (IUCN) published its report "[Guidelines for planning and monitoring corporate biodiversity performance](#)." The report provides a platform for industry to measure and report its contribution to biodiversity conservation. It has informed our own efforts toward identifying potential indicators for biodiversity performance and disclosure, which we will further develop throughout 2022.

Exploration of biodiversity-related metrics also continued in 2021 through a partnership funded by Alcoa Foundation and led by the Wildlife Conservation Society with input from The University of Queensland and The Biodiversity Consultancy. The goals include improved systems and tools to reduce the drivers of biodiversity loss.

Operational Site	Site Location & Size	Position	Biodiversity Value
Huntly and Willowdale bauxite mines	Jarrah Forest, Western Australia	Adjacent to protected areas; within an area of high biodiversity value	Recognized by Conservation International as an international biodiversity hotspot; threatened species and ecological communities (International Union for Conservation of Nature and federal government listed)
Anglesea power station and related	Anglesea, Victoria, Australia 787 hectares (1,945 acres)	Within and adjacent to a protected area	Protected area; threatened species and ecological communities (International Union for Conservation of Nature and federal government listed)
Wagerup alumina refinery	Wagerup, Western Australia 6,000 hectares (14,826 acres)	Adjacent to areas of high biodiversity value	Ramsar listed wetlands adjacent; threatened species and ecological communities (International Union for Conservation of Nature and federal government listed)
Portland Aluminium smelter	Portland, Victoria, Australia 522 hectares (1,290 acres)	Adjacent to a protected area	Threatened species and ecological communities (International Union for Conservation of Nature and federal government listed)
Juruti bauxite mine and related railroad and port facility	Juruti, Pará, Brazil 29,426 hectares (72,713 acres)	Within an area of high biodiversity value	Amazon rainforest and river; threatened species and ecological communities (International Union for Conservation of Nature listed)
Poços de Caldas operations (bauxite mine, alumina refinery and aluminum smelter—the smelter closed in June 2015)	Poços de Caldas, Minas Gerais, Brazil 2,327 hectares (5,750 acres)	Within an area of biodiversity value	Fragmented native forests; threatened species (International Union for Conservation of Nature listed)
Baie-Comeau aluminum smelter	Baie-Comeau, Quebec, Canada 729 hectares (1,801 acres)	Within the Manicouagan – Uapishka Biosphere Reserve	Salt marshes and marine environments of the Saint Lawrence River; boreal forests
Lista aluminum smelter	Lista, Norway 248 hectares (613 acres)	Within the Lista Wetlands System, a network of Ramsar-listed reserves	Varied habitat types, including dunes, lakes and wetlands; rich bird diversity, including migratory species; conservation-significant plant species
Coermotibo bauxite mine operations (ceased operation in October 2015)	Marowijne District, Suriname 32,800 hectares (81,051 acres)	Adjacent to and within a protected area	Adjacent to and within International Union for Conservation of Nature protected area; threatened species (International Union for Conservation of Nature listed)

Operational Site	Site Location & Size	Position	Biodiversity Value
Point Comfort alumina refinery (closed in 2019)	Point Comfort, Texas, USA 1,417 hectares (3,501 acres)	Adjacent to an area of biodiversity value	Native grassland and intertidal emergent marsh (protected under the Clean Water Act); important breeding habitat for wading birds.

Protected area status follows definitions described in Dudley, N. (Editor) (2008). Guidelines for Applying Protected Area Management Categories. Gland, Switzerland: IUCN. x + 86pp.

BIODIVERSITY ACTION PLANS

We have developed and implemented biodiversity action plans at the following locations:

- Huntly and Willowdale bauxite mines in Western Australia
- Kwinana, Pinjarra and Wagerup refineries in Western Australia
- Portland Aluminium smelter in Australia
- Alumar refinery in Brazil
- Juruti bauxite mine in Brazil
- Baie-Comeau, Deschambault and Becancour smelters in Canada
- Fjarðaál smelter in Iceland
- Mosjøen and Lista smelters in Norway
- San Ciprián refinery and smelter in Spain
- Massena smelter in the U.S.

At each of these sites, the biodiversity action plan:

- Identifies the biodiversity within the area of direct management control or significant influence, including the presence of listed threatened species and communities, in context with surrounding land;
- Assesses potential impacts, both positive and negative;
- Develops a range of strategies aimed at minimizing or mitigating biodiversity impacts;
- Informs our employees and communities in which we operate about the importance of biodiversity protection, and encourages their participation in biodiversity initiatives; and
- Sets and reports performance against site-specific targets.

Our three operating locations that do not yet have a biodiversity action plan completed a biodiversity risk gap analysis in 2020. Each is progressing toward completion of a more detailed risk assessment and action plan where material biodiversity risks are identified.

ECOSYSTEM SERVICES

Ecosystem services are benefits obtained from natural ecosystems. These may be goods or raw materials, such as food, timber or fresh water. They also may be services carried out by ecosystems, including climate mitigation, erosion control and disease control. A company can benefit from ecosystem services as well as impact them.

There are many situations where ecosystem services benefit our business. These include:

- The provision of essential water supplies for our operations
- Soil conservation and sediment control in our hydropower watersheds
- Rehabilitation of mined land by providing seeds of native plants, naturally re-colonizing microorganisms, flora and fauna
- Restoration of ecosystem processes, such as nutrient, carbon and water cycles, that ensure long-term success

Ecosystem services receive explicit consideration in our operations. For example, we deliberately incorporate the Brazil nut tree, which is economically important for the local community, into our rehabilitation efforts at our Juruti mine to support future community livelihoods. Our mines in Western Australia have incorporated outdoor recreation activities, such as mountain bike riding trails, into previously mined areas that have been rehabilitated to jarrah forest.

Mine Rehabilitation

Rehabilitation is a post-mining activity, but we begin planning for it in the very early stages of a mine's development. When we inherit legacy obligations at former mine sites, we begin rehabilitation planning as soon as we recognize such an obligation.

We engage with stakeholders to develop a rehabilitation plan to ensure that the site can be returned to sustainable use. In many cases, we strive to return the land to its natural state, such as forests, wetlands and grasslands. Where appropriate, and in concert with government or local communities, our rehabilitation supports other productive land uses, including farming and residential, recreational, commercial or industrial developments.

We strive to lessen the impact of our mining operations by minimizing the environmental footprint for each mine. This includes minimizing the land disturbed for mining and progressively rehabilitating disturbed areas that are no longer required for operations.



Rehabilitated mine areas in the Jarrah forest in Huntly, Australia.

Our rehabilitation approaches vary in response to local biophysical conditions and rehabilitation objectives.

In certain locations, for example, naturally occurring sulfide minerals contained in overburden have the

potential to release low pH (acidic) water when exposed to air, resulting in dissolved metal concentrations in surface water and groundwater (acid rock drainage, or ARD). Some clay overburden materials also exhibit these characteristics. To prevent the potential release of acid and metals, we have managed this material through selective handling that involves encapsulation or sub-aqueous (underwater) placement.

Where a sustainable native ecosystem is the rehabilitation objective, we conserve and reuse topsoil. This topsoil contains seeds, nutrients and microbes that are essential for successfully establishing a diverse and sustainable vegetation cover after mining.

In addition to preserving topsoil, we apply many strategies to optimize the number of plant species in rehabilitated areas. These include spreading collected and specially treated seeds and planting nursery-grown seedlings. We may use cuttings and tissue culture propagation techniques for species that generally do not produce viable seeds.

Alcoa is a founding member of the [Co-operative Research Centre for Transformations in Mining Economies](#) (CRC-TiME), which is an Australian national research and development initiative that was established in 2020 to help drive transformational change in mine closure processes. The 10-year initiative will draw on the combined inputs of the Australian commonwealth government and a consortium of more than 40 members from industry, the mining services sectors, Australian state governments, research providers and community associations. The aim is to improve the success of mine closure and relinquishment and enable regions and communities to transition to a more sustainable post-mining future.

In 2021, we continued working with partners on a project proposal being considered by CRC-TiME that is aimed at developing improved equipment and techniques for the treatment of native seed and delivery of seed to the soil surface. These new approaches are anticipated to increase the success and efficiency of the critical establishment phase of rehabilitation.

MINING AND REHABILITATION ACTIVITY

During 2021, we had four active bauxite mining areas in Australia and Brazil. A number of inactive mines that are in the process of final rehabilitation and closure also contributed to the year's total open-mine area. We also have a minority equity interest in a bauxite mine in each of three countries—Brazil, Guinea and Saudi Arabia. Data from these three mines are not included in this report.

Our goal is to maintain a corporate-wide running five-year average ratio of 1:1 or better (meaning less than one) for active mining disturbance (excluding long-term infrastructure) to mine rehabilitation. This will manage net expansion in the area of land disturbed.

The ratio for the 2017 to 2021 period was 0.82:1, which indicates we had more areas rehabilitated or transferred to other land users compared to new disturbances. We expect the ratio to decrease over the next few years as more areas of our closed mines in Suriname are returned to the government of Suriname after rehabilitation.

We engaged [ERM CVS](#) to provide limited third-party assurance on our 2021 mine rehabilitation data at operating sites. The company's limited assurance statement is available in the [Appendix](#).

Mining Land Disturbed/Land Rehabilitated Hectares

	Open Mine Area (Cumulative as of year-end)	Area Disturbed (Annual)	Area Rehabilitated (Annual)
2017	15,448	1,173	1,008
2018	15,769	1,243	923
2019	15,805	1,368	1,140
2020	15,636	1,354	1,523
2021	15,392	670	914

One hectare equals approximately 2.5 acres. Open mine area is the cumulative area of land that has not been rehabilitated (including active mines and land used for mining infrastructure). Area disturbed means land used in each reported year for mining or for mining infrastructure (e.g., roads, shops, crushing equipment, conveyors). Area rehabilitated means land returned to natural conditions or to productive use (such as farming) after mining or decommissioning of mine infrastructure in each reported year. Generally, the open mine area in each reported year should be the open mine area from the preceding year plus any area disturbed and minus any area rehabilitated.

Open Mine Area Hectares

	Australia	Europe/ Africa	North America	South America	Total
2017	5,614	0	1,068	8,766	15,448
2018	5,739	0	1,003	9,027	15,769
2019	6,029	0	736	9,040	15,805
2020	6,176	0	656	8,804	15,636
2021	6,033	0	644	8,715	15,392

One hectare equals approximately 2.5 acres. Open mine area is the cumulative area of land that has not been rehabilitated, which includes active mines and land used for mining infrastructure. Open area decreased in all regions during 2021. The area of rehabilitation exceeded new disturbance at our active Huntly, Juruti and Willowdale mines, while in North America and Suriname closed mines continued to be rehabilitated or returned to the government of Suriname.

Area Disturbed Hectares

	Australia	Europe/ Africa	North America	South America	Total
2017	675	0	50	448	1,173
2018	675	0	48	520	1,243
2019	954	0	9	406	1,369
2020	822	0	0	532	1,354
2021	472	0	0	198	670

One hectare equals approximately 2.5 acres. Area disturbed means land used in each reported year for mining or for mining infrastructure (e.g., roads, shops, crushing equipment and conveyors). In both Australia and South America, reductions in disturbance in 2021 were related to changes in mine plans.

Area Rehabilitated Hectares

	Australia	Europe/ Africa	North America	South America	Total
2017	412	0	110	486	1,008
2018	550	0	113	260	923
2019	665	0	83	392	1,140
2020	675	0	80	768	1,523
2021	614	0	13	287	914

One hectare equals approximately 2.5 acres. Area rehabilitated means land returned to natural conditions or to productive use (such as farming) after mining or decommissioning of mine infrastructure in each reported year. The decrease in area rehabilitated in 2021 in Australia relative to the previous year was mainly due to changes in mine plans and reduced new disturbance. In South America, areas rehabilitated returned to more typical annual rates in 2021, following handover of substantial areas to the government of Suriname in 2020.

Return of the Native Animals

Western Australia is helping our experts and the industry better understand the return of forest fauna throughout the different stages of mine rehabilitation.

We are currently monitoring sites within unmined forest, unmined stream zones and rehabilitation sites that are five, 10 and 15 years old. This allows us to confirm that suitable habitat develops over time in rehabilitation areas to achieve animal species diversity and numbers that are similar to the surrounding jarrah forest.

Our experts conduct the surveys each year, alternating between the two mines. Since different species are more active at varying times of the year, we conduct the survey for six to eight weeks in both winter and summer.

The survey involves trapping, identifying, recording and quickly releasing the animals. Humane cage traps are used for larger mammals, cameras capture shy species, and a drift fence guides small mammals, frogs and invertebrates like spiders into a trap. A dot of paint or a small patch of trimmed fur helps ensure captured animals are counted only once.



Quokka captured by a camera trap

their presence is a good indicator of rehabilitation success.

We use the survey results to make improvements to our rehabilitation program, such as returning hollowed-out logs to provide habitat for various animals like the chuditch. The results also have demonstrated that mining is a temporary disturbance, with several faunal groups returning to the rehabilitated areas within a relatively short timeframe.



Chuditch

The 2021 winter survey at the Willowdale mine recorded nearly 180 animals representing more than 30 species. These included two listed threatened species ([chuditch](#) and [quokka](#)) and two priority conservation species ([southern brown bandicoot](#) and [western brush wallaby](#)). A special find was trapdoor spiders, which have a lifespan of more than 40 years. These protected spiders live within a very localized area and are susceptible to disturbance, so



The Plot Thickens... with Less Fertilizer

A nearly 30-year Alcoa research project on the effectiveness of fertilizers in mine rehabilitation sprouted some unexpected results in Australia's jarrah forest—the application of very little to no fertilizer has enabled greater plant diversity and numbers.

The jarrah forest is rich in plant species, even though the soils are naturally low in nutrients. In areas mined for bauxite, the conventional practice was to apply fertilizer during rehabilitation to facilitate quick and vigorous plant growth.

In the mid-1990s, our Western Australia operations began collaborating with local universities to establish trial plots within newly rehabilitated areas in the jarrah forest to examine the impact of differing levels of fertilizer use. Key results over nearly three decades of research were:

- In the early phases of rehabilitation (one to two years), fertilized plots had a higher number of plants.
- Over the long term, plots with very little or no fertilizer had more plant species, individual plants and covered ground.

The primary reason for the vigorous early growth in the fertilized plots was that conditions favored weeds and quickly fading plants. These blocked the slower-growing and more diverse species from taking root, leading to less diversity and numbers over the long term.

Based on the study's results, we halved our fertilizer use in jarrah forest mine rehabilitation beginning in 2016. We are currently evaluating either eliminating or further reducing its use.



Monitoring a plot

Climate Protection

7 AFFORDABLE AND CLEAN ENERGY



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



4 RISK MANAGEMENT



6 ENVIRONMENTAL PERFORMANCE



Building on our history of reducing GHG emissions in our industry, we have set an ambition to achieve net-zero GHG emissions across our global operations by 2050 for direct (scope 1) and indirect (scope 2) emissions.

Our path to achieving this ambition includes increasing the use of renewable energy in our operations, portfolio decarbonization, and developing new technologies that are important to unlocking decarbonization at scale and bringing them to the market over time. Carbon dioxide represents most of our GHG emissions.

Our endeavor to reach net-zero GHG emissions by 2050 for direct and indirect emissions aligns with our strategic priority to advance sustainably. It also complements our short- and mid-term GHG reduction targets.

Introduced in 2020, our short- and mid-term goals align our GHG (direct + indirect) emissions reduction targets with the below 2° C decarbonization path defined in the Paris Climate Accord. We are committed to reducing our GHG emission intensity by 30 percent by 2025 and 50 percent by 2030 from a 2015 baseline. We achieved a 23.9 percent reduction from the baseline through 2021.

Our total 2021 carbon dioxide equivalent (CO_{2e}) emissions equaled 21.8 million metric tons, of which 17.4 million metric tons were direct emissions. This represents a 9.1 percent decrease in total emissions and a 10.7 percent decline in intensity compared to 2020. The decreases were primarily driven by the curtailment of the Intalco smelter and a continued focus on operational stability and optimization.

Our Scope 3 (supply chain) emissions in 2021 were 47.5 million metric tons of CO_{2e} for eight categories: purchased goods and services, fuels and energy-related activities, transportation and distribution (upstream), waste generated in operations (landfill only), business air travel, product transportation and distribution (downstream), emissions generated by joint ventures, and processing of intermediate products sold to customers (excluding emissions from further downstream processing of alumina from bauxite and aluminum from smelter-grade alumina). Approximately 80 percent of our Scope 3

emissions come from the latter category and correspond to the transformation of alumina into aluminum by our customers.

We use an activity-based calculation methodology and rely on upstream and downstream emission factors from published sources and subscription based services. Scope 3 emissions from purchased goods and services reflect 99 percent of the volume of raw material purchased. Newly included in the emission total are Alcoa's equity share of emissions from joint ventures. Reported emissions represent a 16 percent increase compared to 2020, however this increase was simply the addition of the previously mentioned reporting category, and the use of more representative emission factors.

We engaged [ERM CVS](#) to provide limited third-party assurance on our 2021 carbon emissions data. The company's limited assurance statement is available in the [Appendix](#).

Carbon Dioxide Equivalent Emissions Intensity

Metric tons of CO_{2e} per metric ton of production (IPCC, 5th AR)

		Refining	Smelting	Total
2015	BASELINE	0.55	6.06	7.10
2017		0.53	4.20	5.21
2018		0.52	5.60	6.60
2019		0.52	5.98	6.96
2020		0.52	5.08	6.06
2021		0.52	4.43	5.41

Data is for Scope 1 and Scope 2 emissions. The total represents the combined impact of refining and smelting operations indexed to metric tons of primary aluminum production (refining is included at a ratio of 1.9 metric tons of alumina to 1.0 metric tons of smelted aluminum). These two processes and their associated power supply represent 86 percent of our total GHG emissions. Calculations of these emission intensities conform to the IAI Aluminium Sector Greenhouse Gas Protocol using 100-year global warming potentials provided by the Intergovernmental Panel on Climate Change (IPCC). The 2015 baseline changed from prior reporting to correct an underlying data error.

Carbon Dioxide Equivalent Emissions

Million metric tons of CO_{2e}

	Direct (Scope 1)	Indirect (Scope 2)	Total
2017	16.20	5.80	22.00
2018	17.50	6.70	24.20
2019	17.70	6.60	24.30
2020	18.50	5.40	23.90
2021	17.40	4.40	21.80

Alcoa reports on an operational control basis. Of our 21.8 million metric tons of CO_{2e} emissions in 2021, 21.2 million metric tons were associated with carbon dioxide, 0.41 million metric tons were associated with perfluorocarbon (CF₄ & C₂F₆), 70,000 metric tons were associated with methane, 44,000 metric tons were associated with nitrous oxide and 8,100 metric tons were associated with sulfur hexafluoride (SF₆). There were no significant hydrofluorocarbon emissions. We had 7,600 metric tons of biogenic CO_{2e} emissions from the combustion of biodiesel. These emissions are not included in the total 2021 CO_{2e} emissions. In 2021, 62 percent of our direct emissions were covered under an emissions-limiting regulation or program that is intended to directly limit or reduce emissions.

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

Climate-related Risks

In 2019, we conducted the first analysis of our operations following the recommendations from the [Task Force on Climate-related Financial Disclosures](#). With the help of an external consultant, we assessed our climate-related transition and physical risks and opportunities to identify paths to improve our processes for addressing such risks and leveraging the opportunities.

Key findings included:

- Policy risk exposure is higher in Australia given the concentration of our operations in that country. This could be relevant depending on the future cost of carbon.
- We are significantly exposed to the construction and automotive markets, and both are expected to be impacted by high carbon prices. Market risk exposure measures the changes in revenue mix and sources as a result of climate risk.

- Our reputational risk exposure is low because of the strong reductions we have made in GHG emissions and the public commitments to continue reducing emissions in alignment with the Paris Climate Accord.
- Technology risk exposure—the risk of substituting existing products and services with lower-emissions options—has been assessed as a moderate risk for our company. Aluminum is considered part of the solution for the decarbonization of society (e.g., aluminum enables lower emissions in transportation due to light weight), even if it is an energy-intense industry.
- The physical risks from an increased severity of extreme weather events, like cyclones and floods, changes in precipitation patterns, and rising mean temperatures and sea levels, were classified as low level across our global portfolio. Some specific sites are exposed to water stress, wildfire and hurricane risk under different scenarios, such as precipitation and temperature changes.

For physical risk exposure, we completed three separate studies in 2020 to understand the climate data for each of our operating impoundment sites in Australia, South America and Spain. This included historical meteorological data (rainfall, temperature, wind, evaporation, etc.) from multiple external peer-reviewed sources that was typically over 100 years, or as far as independent location records exist.

We also developed climate change modelling scenarios for 2050 and 2100 to serve as a guide on the likely impacts to the baseline historical climate data for our operating impoundment locations. The data and modelling scenarios support the master planning at our locations and future impoundment designs and operational strategies by enabling us to consider potential physical risk impacts.

To develop the second iteration of our climate-related risk analysis in a more detailed manner, we have commissioned an internal team to create scenarios to analyze the financial implications of climate change following the recommendation of the Task Force on Climate-related Financial Disclosures. As part of this initiative, we also will develop a more granular analysis of the potential physical impact of climate change on our operations. We expect to complete the work in 2023.

Climate Strategy

To operationalize our new 2050 ambition, we placed the leadership of our Climate Strategy Team under our Corporate Strategy function. Consisting of cross-functional, senior-level employees, the team provides a focused view on our climate strategy and the needed governance to structure the decarbonization roadmap from a technology and energy strategy perspective.

In 2021, we published our [Climate Change Policy](#) to further our commitment to understanding and managing climate- and carbon-related risks and opportunities within our operations. In particular, the policy addresses the following topics:

- Governance, with our Executive Team and Board of Directors responsible for oversight of our climate- and carbon-related policies
- Long-term ambition to achieve net zero carbon emissions by 2050
- Short- and mid-term objectives and reporting practices to ensure alignment with the below 2° C decarbonization path included in the Paris Climate Accord and transparency in reporting
- Integration of climate change considerations into decision-making processes, such as corporate development practices or capital expenditures (see the [Energy](#) section for more information)
- Incorporation of a carbon shadow price in long-term planning assumptions that we use for business decisions
- Enhancement of the resilience of our operations and communities through partnerships
- Climate-related opportunities, including differentiated products, process efficiencies and innovative solutions
- Advocacy to communicate our position in key areas, such as the need for a global price of carbon

Our climate strategy work in 2021 focused on the development of the conceptual decarbonization path for our smelters and refineries and the definition of an internal shadow price to be considered in long-term business decisions. Our strategy and performance again led to Alcoa being named to the Dow Jones Sustainability Index during the year.

CARBON ACCOUNTING

At the corporate level, we maintain an auditable inventory of carbon emissions to monitor progress against targets and report transparently to our different stakeholders. We have developed carbon footprint calculations for most of our products to support the commercial opportunities for differentiation of low-carbon aluminum in the market and to help our customers reduce the carbon footprint of their own products.

CARBON EMISSIONS REGULATIONS

Countries around the world are moving at different speeds toward strengthening regulations on carbon emissions. Our experience with the carbon markets in Europe and Canada informs our approach to future pricing mechanisms used to reduce carbon emissions.

Phase 4 of the European Union's Emission Trading Scheme, which covers the period 2021 to 2030, has a direct impact on carbon and energy pricing for the operating locations within the region.

In the U.S., legislative changes under consideration in the state of Washington and the Climate Leadership and Community Protection Act in New York may have future impacts on our smelters in those states. We are also monitoring actions at the federal U.S. level closely.

In Australia, the National Greenhouse and Energy Reporting (NGER) scheme has transitioned toward baselines for Scope 1 emissions to be set either by production-adjusted or calculation-based baselines, with both processes applying specified emissions factors for sectors to determine the baselines.

The policy that will drive Australia to its net zero by 2050 commitment is through the country's Technology Investment Roadmap. In 2020, the policy defined five strategic priority technologies and sectors that form the backbone, with one of those being low-emissions steel and aluminum industries. Ongoing opportunities for funding that can deliver emissions reductions to industry continue to open up. In 2020, we were granted funding to investigate the feasibility of mechanical vapor recompression (MVR) at our Western Australian refineries under one of the funding schemes.

The percentage of our Scope 1 GHG emissions that is covered under a program that is intended to limit or reduce emissions, such as cap-and-trade schemes, carbon tax/fee systems and other emissions control systems, is 53 percent. We operate under such programs in Australia, Canada and the European Union.

Our Scope 2 GHG emissions are directly related to the type and amount of energy we consume. We are working to increase our use of renewable energy sources by incorporating carbon exposure costs in our economic models and also improving the energy efficiency of our operations. A full discussion of our energy strategy can be found in the [Energy](#) section.

DECARBONIZATION STRATEGY

Our Climate Strategy Team has focused significant effort in reviewing our decarbonization strategy and strengthening it to meet the new net zero ambition. In November 2021, we unveiled our [technology roadmap](#) of future-oriented research and development projects that includes major decarbonization initiatives.

Through a [A\\$11.3 million grant](#) from the Australian Renewable Energy Agency (ARENA), we are testing the application of renewable energy to potentially reduce carbon emissions from the alumina refining process by up to 70 percent. The MVR technology recycles low-pressure steam in the refining process, reducing carbon emissions. MVR also has the potential to significantly reduce water use in the refining process by capturing water vapor that would otherwise be lost to the atmosphere.

Other technologies we are exploring to decarbonize the alumina refining process include electric calcination, which allows for a self-enclosed calciner operating environment that captures steam and allows the calciner to be connected to a renewable-powered electric grid. We are also researching solar thermal energy as a means of providing process heat to displace fossil fuels.

We continued our work to decarbonize the smelting process with the June 2021 [start of construction](#) on the first commercial-scale prototype cells of the ELYSIS inert anode technology. ELYSIS is a joint venture company led by Alcoa and Rio Tinto that is developing the breakthrough technology, which eliminates all direct GHGs from the traditional smelting process and instead produces oxygen.

In November 2021, ELYSIS [announced](#) that it was successfully producing aluminum without any direct GHG emissions at its Industrial Research and Development Center in Saguenay, Québec, Canada. The production of aluminum at the center marks the achievement of a significant milestone: using a full industrial design at a size comparable to small smelting cells operating in the industry today.

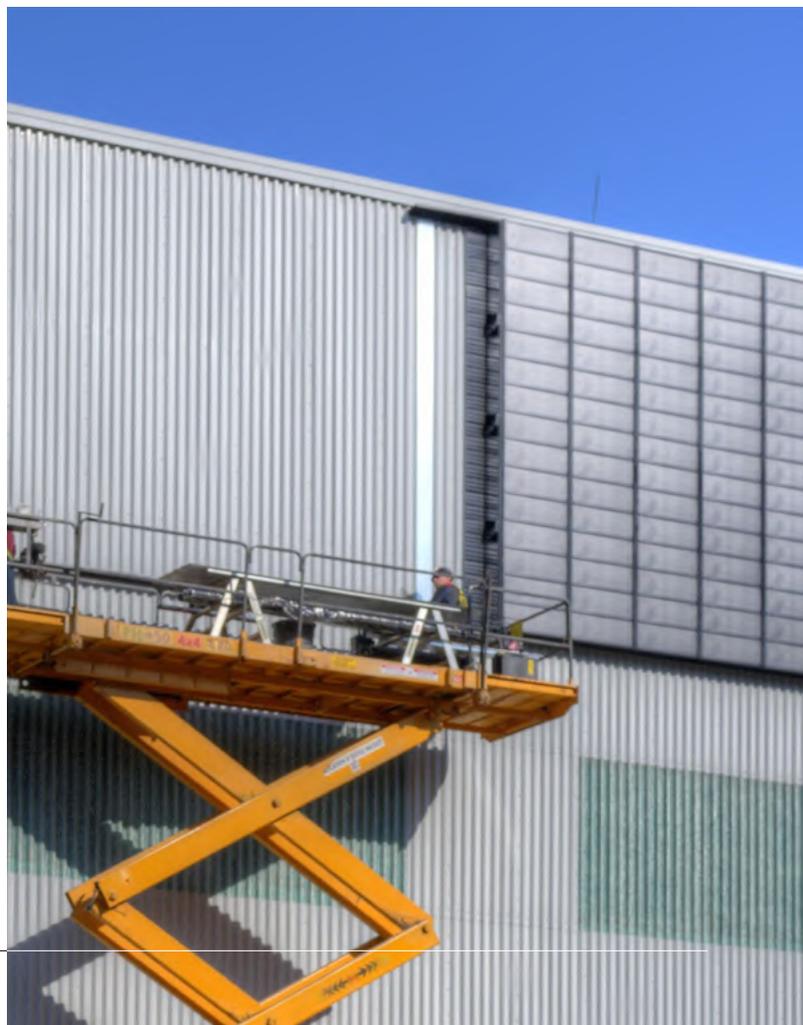
We are continuing our five-year review of our operating portfolio that we announced in October 2019 to consider

opportunities for improvements, potential curtailments, closures and divestitures. Once the review is complete, we expect to have the lowest average intensity of carbon emissions among all global aluminum companies.

One result of the review was [our announcement](#) that we would restart the Alumar smelter in São Luís, Brazil, which has been fully curtailed since 2015. The smelter will be powered with 100-percent renewable energy, increasing our offer of aluminum made with low-carbon emitting processes.

Our global alumina refinery portfolio already has the lowest carbon footprint among global producers. Other ways by which we intend to lower our GHG footprint in aluminum smelting are through process improvements and our portfolio review, which will include boosting the percentage of our renewable energy from 78 percent in 2020 to more than 85 percent of our smelters' energy consumption by 2025. We were at 81 percent in 2021.

Our executive long-term incentive program is linked to increasing our use of renewable energy within our smelting portfolio and sustaining our position as the lowest-emitting refinery. We increased the renewable energy in our portfolio from 78 percent in 2020 to 81 percent in 2021.



PRODUCTS

We are developing greener products to help our customers deliver more sustainable products to society and also realize the value of the carbon-free energy in our value chain.

An example is our Sustana line of aluminum products, which we produce with low-carbon emissions or recycled content. In 2020, we expanded the line to include EcoSource, the world's first and only low-carbon, smelter-grade alumina brand. It has a carbon footprint that is no higher than 0.6 metric tons of carbon dioxide equivalents, which is better than 90 percent of the other alumina refineries operating today. (See the [Products](#) section.)

We are also active in the development of standards that incorporate carbon measures into the value of products. The Corporate Average Fuel Economy (CAFE) standards in the United States, for example, are encouraging automakers to use lightweight materials, such as aluminum, to meet more stringent fuel-efficiency requirements.

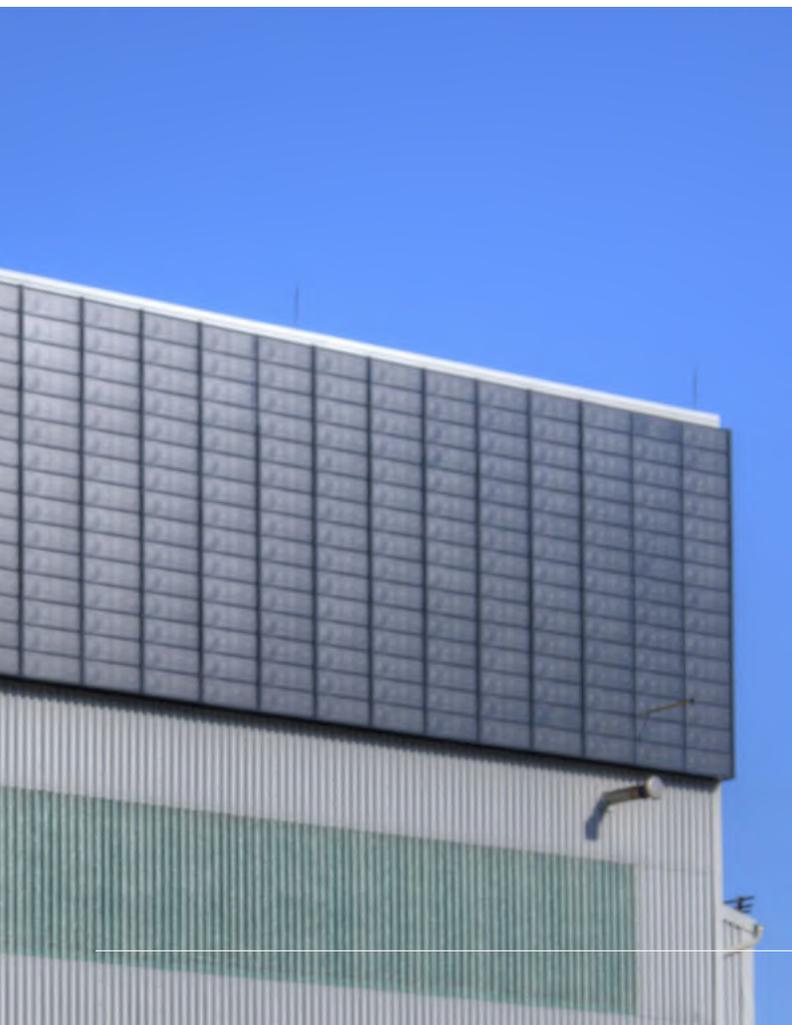
ADVOCACY

Through industry associations and direct contact, we engage with global stakeholders on the issue of GHGs to ensure fair and effective policies and regulations. These stakeholders include elected officials, government agencies and NGOs.

As an active member of the Standards Setting committee of the [Aluminium Stewardship Initiative](#), we helped develop industry standards that include GHG emissions. We are also working through organizations like the [Aluminium Association of Canada](#), [Australian Aluminium Council](#), [European Aluminium](#), [International Aluminium Institute](#) and [The Aluminum Association](#) to inform the industry's approach to, and engagement on, carbon regulation.

During 2021, we continued to engage with government representatives, legislators, NGOs and other stakeholders in the U.S. states of New York and Washington on carbon legislation. We interacted with stakeholders in the European Union (EU) on the revision of the [Emission Trading System Directive](#), [Clean Energy for All Europeans](#) package and [A Clean Planet for All 2050](#) vision. We continued discussions with the Quebec government regarding its cap-and-trade program for 2024 to 2030, and we engaged with the government in Australia on the impacts of climate policy and regulations.

Alcoa Foundation is engaging with governmental organizations and NGOs to advocate the prevention of, and resilience to, climate change. In East Iceland, for example, the foundation is partnering with the Soil Conservation Service to stop erosion from land containing significant carbon sequestered within its soil. Without action, the organic soil will be lost, increasing carbon emissions into the atmosphere.



Energy

7 AFFORDABLE AND CLEAN ENERGY



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



6 ENVIRONMENTAL PERFORMANCE



Energy is a critical resource for Alcoa due to the energy-intensive nature of our refining and smelting processes.

Securing low-cost and competitively priced electricity with minimal environmental impact is a focal point of our long-term energy strategy. We also work to reduce the amount of energy we consume through operational efficiency and technological advances, which lower our costs and GHG emissions.

For all of our operations, we have defined short- and long-term energy reduction targets that are integrated into our overall GHG emissions reduction target. These targets will be realized through process and energy-efficiency performance and our long-term portfolio strategy. (See the [Climate Protection](#) section for more information.)

As part of our commitment to climate protection, we have criteria to evaluate energy consumption and sources of energy as part of our process to consider any potential new projects or major expansions. This allows us to maintain a cohesive portfolio of operations aligned with our long-term goals.

We also consider carbon-related impacts in our capital expenditure process when developing the business case for the financial model used in capital allocation decision-making. Projects that impact carbon emissions (positively or negatively) are considered throughout the approval process and project development.

Energy Intensity

Gigajoules per metric ton of aluminum produced

2017	73.6
2018	73.9
2019	74.1
2020	73.3
2021	73.0

Energy intensity values reflect the net energy value after energy is sold to the grid. Refining is included at a ratio of 1.9 metric tons of alumina produced to 1.0 metric tons of smelted aluminum. The intensity data represents the amount of energy we use onsite in the form of fuels or purchased electricity to produce alumina and aluminum.

2021 Energy by Source

	Direct		Purchased Electricity	
	Thousands of Gigajoules	Percent	Thousands of Megawatt Hours	Percent
Natural Gas	102,264	55.3	3,891	10.1
Hydro	0	0	26,170	68.0
Coal	66,800	36.1	2,786	7.2
Oil	11,787	6.4	38	0
Other Renewables	107	0.1	3,691	9.6
Diesel	3,663	2	1,099	2.9
Nuclear	0	0	831	2.2
Propane	118	0	0	0
Distillates	16	0.1	0	0
Local Grid	0	0	0	0
Total	184,755	100.0	38,507	100.0

Other renewables include geothermal, biomass, solar and wind energy. Purchased electricity percentages do not add up to 100 percent due to rounding.

Our energy intensity decreased by 0.4 percent in 2021 compared to the prior year. Our overall energy consumption also decreased by 7.1 million gigajoules, or 2.1 percent, in the same period. Key factors behind the performance are the fully started Bécancour smelter in Canada, and the curtailment of the Intalco smelter in the United States.

For energy consumption, we use the [Greenhouse Gas Protocol](#) developed by the [World Resources Institute](#) and [World Business Council for Sustainable Development](#) to establish boundaries for our calculations and account for mergers, acquisitions, divestitures, startups, curtailments and closures of operating facilities. We report energy consumption based on operational control as defined in the Greenhouse Gas Protocol. The [Intergovernmental Panel on Climate Change Guidelines](#) and country-specific databases, such as the U.S. Environmental Protection Agency's [Emissions & Generation Resource Integrated Database](#), continue to serve as our source of data on the characteristics of electric power generation and heat content values for fuel sources. Where a location has no power purchasing choice, or power alternatives, and a supplier specific factor represents the grid emissions, the supplier specific factor is considered to be location based.

[ERM CVS](#) provided limited assurance of our 2021 energy consumption data. ([View the limited assurance statement.](#))

Energy Security

Our corporate Energy team is responsible for purchasing approximately 300 terajoules of natural gas per day and supplementing our self-generated power with approximately 3.6 gigawatts of purchased electricity. We secure approximately 40 percent of our natural gas and 80 percent of our electricity under arrangements that exceed ten years.

Smelters are our largest consumers of electricity, and renewable sources comprised approximately 81 percent of their power consumption in 2021. We have an internal target to achieve 85 percent renewable power consumption by 2024.

Our Canadian smelters (Bécancour, Deschambault and Baie-Comeau) are supplied with 99.8 percent renewable

energy. The Deschambault smelter achieved ISO 50001 energy management certification in 2021.

In 2021, hydroelectricity accounted for 100 percent of purchased energy consumed by our Alcoa Fjarðaál smelter in Iceland. At the Massena facility in New York in the United States, 99 percent of the purchased energy consumed by the smelter came from hydroelectricity. Our Mosjøen and Lista smelters in Norway, both of which are certified to the ISO 50001 energy management standard, use near 100-percent renewable electricity generated from hydro and wind resources.

In 2021, we announced that we are collaborating with Alinta Energy on its proposed 1,000-megawatt windfarm to potentially convert our Portland Aluminium smelter in Australia to 100-percent renewable power. If approved, the offshore windfarm could take up to ten years to build.

Our portfolio of energy assets is composed of equity interests in consortia and wholly owned facilities. Our share of the generation capacity of these assets is 1.5 gigawatts, of which 55.3 percent is low-cost hydroelectric power capacity.

Technological Advances

Our heritage in developing new technologies for the aluminum industry dates to the discovery of the commercial process to make aluminum in 1886 from Charles Martin Hall, who later went on to create a company later known as Alcoa.

In the decades since, our experts have created low-energy smelting cells and improved electrical connections. Our advanced process simulation capabilities create real-world technological advances in alumina refining.

We are also investing in the long-term for potential step-change outcomes. For alumina refining, our experts are examining the use of renewable energy to provide process heat to the Bayer process, displacing fossil fuels.

In aluminum smelting, we continue to invest in research and development to improve energy efficiency and reduce carbon dioxide emissions.

Operational Efficiency

We use a variety of approaches to improve operational energy efficiency, including:

- **Benchmarking:** We identify opportunities to compare our operations against industry leaders.
- **University collaborations:** We access the expertise at various universities around the world to help develop solutions.
- **Best practice sharing:** Through our internal Centers of Excellence, we share best practices and transfer operational improvements across the company using numerous channels, including a network of Alcoa experts who provide direction and training to plant technical staff and operators.
- **Location-specific targets:** We set and monitor energy-efficiency targets for each location and develop an implementation roadmap, accounting for process variations from facility to facility.

Our refining operations have implemented significant process improvements over the past few years, focusing primarily on process controls, heat transfer efficiency and maintenance improvements.

All of our smelters have realized efficiency improvements with the use of the SMART manufacturing platform, which displays process information so that our employees can take action to conserve energy. We are also focused on identifying raw materials and design changes for our smelters that could lead to either more conductive or more efficient management of a smelting pot's heat balance.

We are implementing new technologies in our casthouses that drive energy efficiency, such as oxy-fuel burners that use pure oxygen in a furnace's combustion process to avoid the unnecessary heating of the nitrogen in our atmosphere. We have installed magnetic stirring technologies at two of our casthouses to more efficiently mix molten metals, and we have implemented program and hardware changes on our furnace control systems to better regulate pressure and temperature.

Demand Response Initiatives

Storing electricity, unlike other forms of energy, is complex. Supply must be consistently balanced with what is consumed, on a real-time basis to preserve stability of the electrical grid and prevent blackouts and other electrical system disruptions. The challenge for utilities is that the normal peaks and valleys of demand vary throughout each day, by season and by region.

As renewable and intermittent energy grows into a higher percentage of overall generation, demand response becomes an increasingly important tool in maintaining the reliability and resiliency of the electric power grid.

Demand response is a practice where certain energy customers, usually larger ones, adjust their electrical usage in response to a signal from a utility or the electric grid to help maintain electric system stability. The energy customer is paid for this service.

Our U.S. smelters participate in demand response, providing some or all the following services:

- **Capacity:** A portion of a customer's load is considered system capacity, allowing the utility to avoid the cost of building additional generation to meet its reserve capacity requirements.
- **Emergency demand response:** A customer will respond within minutes to reduce large blocks of load for short periods of time to balance spikes in demand from other parts of the electric grid. The overall system remains in balance as a result.
- **Spinning reserves:** This service is similar to emergency demand response but on a smaller scale and for a shorter length of time.
- **Load imbalance:** For grids that use solar or wind power, which are intermittent sources of energy, a customer's load is used to keep the grid in balance.
- **Regulation response:** A small percentage of a customer's load is controlled directly by the utility, allowing for real-time adjustments to assist with managing the grid.

In Australia, our Portland Aluminium smelter offers emergency demand response services like those in our U.S. smelters. These include modulation, which is a service that assists in stabilizing the daily grid operation.

We also have an electricity demand management program for our refineries in Western Australia. We reduce our demand for electricity at these facilities during the periods when electricity supply is in shortfall (or potential shortfall). This often coincides with the hottest days of the year, when air-conditioning consumption dramatically increases demand. This service helps support efficient investment in electricity infrastructure and avoids additional costs of electricity generation to cover events that only occur a few times a year.

When higher proportions of renewable energy enter the grid, we often see an excess of available renewable power. This sometimes leads to negative power prices. During these events, we reduce our self-generation and maximize import power, reducing costs and actual net GHG emissions.

Our two smelters in Norway provide load interruptibility to their respective transmission system operator to help reduce the risk of electrical system blackouts. The facilities are remunerated for providing these services

In Canada, we provide interruption rights to our power supplier under our long-term supply contracts. In Australia, our Portland Aluminium smelter offers emergency demand response services like those in

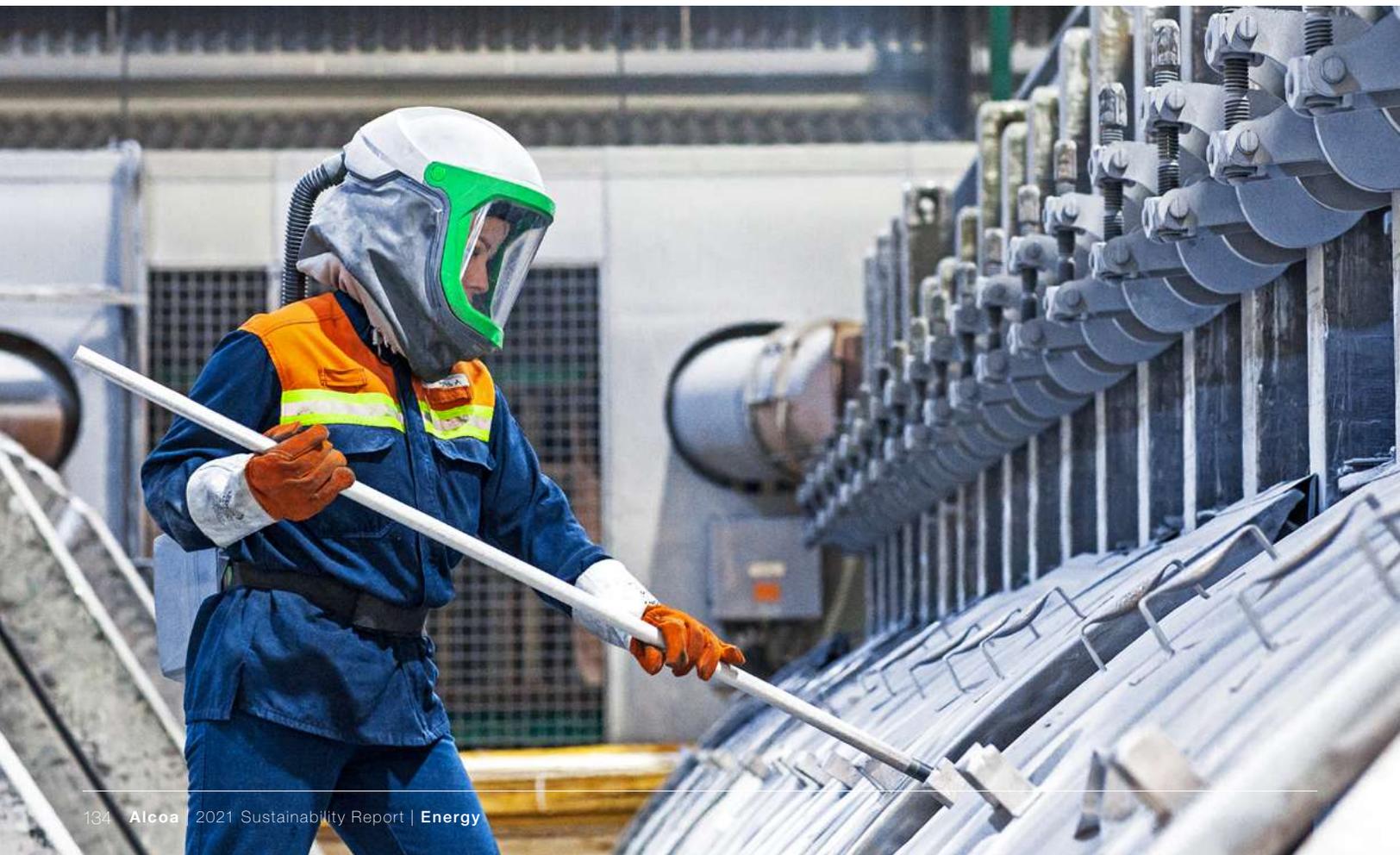
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The Heat Is Off

Operating in the often-frigid environment of Québec, Canada, our Deschambault smelter has turned up the heat on eliminating energy waste and finding renewable energy sources to warm its buildings. The location reduced its consumption of natural gas for heating purposes by 31 percent between 2013 and 2021 with minimal capital expenditures through the engagement and efforts of its employees.



Solar wall comprising perforated black panels

In 2013, heating buildings accounted for 27 percent of the location’s gas consumption. A Kaizen (rapid improvement event) in 2014 identified all waste opportunities, which were prioritized according to an energy hierarchy that progresses from easiest to most difficult to capture. To monitor daily performance, the location developed a new measuring system that considers outside temperatures when determining if natural gas consumption was less than, equal to or greater than the consumption goal.

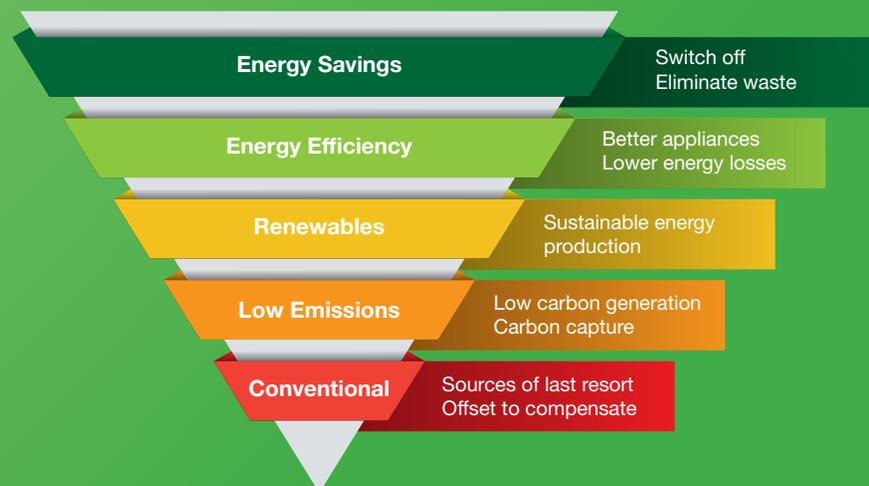
Major achievements through 2021 for the ongoing project include:

- Programming the heating system to turn off during the night shift in unused areas
- Installing more efficient heating equipment, including a natural gas radiant heating system in specific areas
- Recovering and recirculating the hot air in the casthouse
- Installing a solar wall. The perforated black panels are heated by the sun, warming the outside air as it is drawn into the building for four required air changes per day

In 2021, 20 percent of the location’s gas consumption was used for heating—a 7 percent decline since 2013. An added benefit has been a similar reduction in greenhouse gas emissions from heating over the same period.

The location is currently evaluating recovering heat from its smelting pots. Hot air from the pots is diverted to scrubbers to remove emissions, presenting an opportunity to recover excess heat for the smelter’s own use or to sell in the surrounding industrial park.

Energy Hierarchy



Impoundment Management

6 CLEAN WATER AND SANITATION



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



14 LIFE BELOW WATER



15 LIFE ON LAND



4 RISK MANAGEMENT



6 ENVIRONMENTAL PERFORMANCE



W

e manage impoundment facilities at active, inactive and closed sites around the world to store primarily two types of material—bauxite mine tailings and bauxite residue. Both are referred to generically as “tailings.”

An “impoundment” is defined as any dam or other engineered structure intended to confine a body of water (fresh, alkaline or acidic), mine tailings, refining residue, or any other solid or liquid waste material.

Bauxite mine tailings create a mud-like residue that remains after the bauxite is washed at the mine site. Bauxite residue, which is a byproduct of the alumina refining process, consists of mud, some residual caustic soda and, in some cases, a coarse sand fraction.

We design our impoundments to our internal and international standards. We strive to achieve a comprehensive understanding of our impoundment risks and opportunities, implement suitable and effective controls, and manage our impoundments safely and efficiently.

In 2021, we revised our mandated [Global Impoundment Policy](#) to further ensure our impoundments comply with our own rigorous internal standards and guidelines, which may exceed governmental regulations in some countries where they are located, and also the [Global Industry Standard on Tailings Management](#) or the laws and regulations of the country in which a facility is located (whichever are higher). We also use the policy to encourage leading management and governance practices at joint ventures and locations where we do not have direct control of operations. The policy excludes hydroelectric and freshwater concrete dams, which are governed by the laws of the countries in which they are located.

In addition to our internal impoundment policy and standards, we are committed to conform with the Global Industry Standard on Tailings Management along with all ICMM members. The first objective is to ensure compliance of extreme and very high consequence category tailings by August 2023.

Our strategic long-term goal for bauxite residue addresses a key business challenge: reduce bauxite residue land storage requirements per metric ton of alumina produced by 15 percent by 2030 from a 2015 baseline.

Through 2021, we achieved a 14.8 percent reduction against the baseline. We expect to see continued improvement with enhanced solar drying and residue filtration technologies. Filtration is now fully operational at our Kwinana and Pinjarra refineries in Australia, improving the overall efficiency and safety associated with the stored tailings by removing water.

Bauxite Residue Land Requirements Energy Intensity

Square meters of land required per 1,000 metric tons of alumina produced

2015	BASELINE	53.2
2017		50.1
2018		48.3
2019		47.2
2020		46.4
2021		45.3

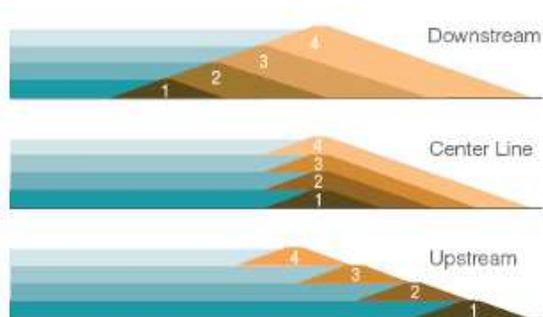
Data is for operational sites only.

Construction and Design

Typically, we construct earthen embankments, or dikes, to form an enclosure for the tailings. The materials are deposited into the enclosure in slurry form and dried over time.

The storage areas are commonly known as tailings ponds or residue storage areas. They are lined with multiple layers of high-density polyethylene (HDPE), with clay or geosynthetic clay intermediate layers. Drainage systems above the liners remove the free water (known as liquor), expedite the consolidation and strength of the tailings and reduce the hydrostatic pressure on the liner. The use of bauxite residue thickening/solar drying and dry stacking (post bauxite residue filtration) at our Kwinana and Pinjarra refineries in Australia further improves this process.

We keep some impoundments at their original crest height (known as a starter embankment), with the perimeter embankment constructed to full height before material is deposited. We raise others over time, with the design governed by the type of tailings being stored, its material characteristics and the method of deposition.



The methods for raising tailings storage areas usually fall into one of the following construction categories:

- **Downstream:** This method involves either building the embankments to full height as an initial construction or raising the impoundment height downstream from the initial dike, which is built from borrowed fill materials.
- **Center line:** Successive raising occurs in such a way that the axis (or embankment center line) of the dike remains in the initial position and coincides with the initial dike axis.
- **Upstream:** Successive levels of the containment dike are constructed on the consolidated and dried tailings previously deposited in the impoundment.

We use various combinations of these methods based on a range of location factors, including climate (particularly rainfall and evaporation rates), topography, and the geotechnical and geochemical nature of the tailings or residue. In some countries in which we operate, the type of tailings construction is based on laws or regulations.

Risk Assessment

We conduct location-specific risk assessments and develop an operational, maintenance and surveillance plan for each location. We review and update both as appropriate throughout the facility's lifecycle.

Our risk assessments consider the following:

- Physical and chemical risks of the impoundment facility
- Environmental risks, including earthquakes, heavy rainfall (storm and annual events), high winds (dust), water scarcity during periods of drought and other issues that could impact the facility and its operation
- Operational risks that need to be controlled, such as over topping and security
- Other risks external to Alcoa and the facility, including location regulatory and permitting risks

The impoundment operational plan identifies mitigation and control measures to eliminate or avoid risk to the extent practicable, reduce risk by minimizing the likelihood or potential consequence of an unwanted event or condition that poses a risk, and detect early, respond to and minimize the consequences if an unwanted event or condition occurs.

Impoundment Management

We have rigorous impoundment standards and protocols developed over decades of safe operating practices. Our technical impoundment standards have been in operation for more than 30 years.

We focus on key elements of management and governance that are necessary to maintain the overall integrity of our impoundment facilities. These include:

- Our mandated Global Impoundment Policy
- An impoundment governance structure that provides global oversight with clearly defined location accountabilities and responsibilities
- Compliance to location regulations and globally mandated Alcoa impoundment policy, and standards covering planning, design, construction, operations, maintenance and closure
- Long-term (25-year) impoundment strategic plans, which are known as impoundment master plans
- Long-term production and capital plans that match the impoundment master plans
- Timely planning, development and implementation of impoundment capital projects
- Monitoring of impoundment embankment stability via installed embankment instrumentation, satellite deformation, geotechnical testing, stability assessments, hypothetical dam-break assessments, and climate and operating parameters
- Trained and qualified personnel in key locations and corporate governance roles, including geotechnical engineering oversight at each location
- Review and assurance, such as peer reviews of impoundment design and annual independent third-party audits/inspections at every impoundment location
- Emergency preparedness and response plans for unforeseen or extreme events
- Reporting—we publicly update our impoundment data annually

In each region where we operate, we also apply an impoundment consequence ratings system as guided by either local regulations or our internal standards. For

example, we use the Brazilian National Mining Agency (ANM) standards in Brazil and the consequence rating system developed by the Australian National Commission on Large Dams (ANCOLD) in Australia. In more recent times, we also have used the Canadian Dam Association (CDA) classification system to provide a consistent basis across global regions. This and other data are updated annually and published [here](#). We are updating all tailing-only impoundment consequence categories in accordance with the Global Industry Standard on Tailings Management.

We regularly review, benchmark and update our impoundment policy, standards, guidelines, 25-year master plans and governance practices to guide the safe and environmentally sustainable management of our tailings' storage. We also look to improve the technologies we use to store and monitor the tailings, and we have spearheaded improvements in the management of impoundments. Some examples include:

- Storing bauxite residue and mine tailings within the mined footprint to reduce disturbance of land
- Progressively moving from traditional “wet” storage of bauxite residue to solar drying (thickened, natural evaporation and mud farming with the use of amphirols, which are screw-driven machines that open the residue crust to increase evaporation), where practical, and filtration and dry stacking. This significantly reduces the potential for impacts on the surrounding environment
- Using bauxite residue storage areas that are typically engineered and compacted embankments and that have an internal composite liner system
- Using underdrainage systems to reduce water pressure on the embankments and allow the bauxite residue to dry and consolidate
- Implementing bauxite residue filtration technology, where bauxite residue is forced through very large press filters that squeeze water from the tailings to reduce the moisture content to approximately 20 percent. The resulting filter cake has a moisture content low enough to allow for more conventional materials handling (conveying) and residue dry stacking via a spreader.



Upgrades to impoundment monitoring at our Poços de Caldas, Brazil, residue storage areas allows Alcoa personnel to continuously monitor them via ground-based radar, satellite deformation radars and installed instruments.

Closure and Rehabilitation

We are focused on progressively closing and rehabilitating tailings storage and impoundment areas. Installation of an appropriate closure (cover) system, effective management of water post-closure and tailings consolidation over time substantially reduce the risk of instability resulting from continued water infiltration.

We undertake field trials and fundamental research on tailings rehabilitation at many of our locations. This research is conducted to better understand the interaction between retained moisture and nutrient cycling in the cover layer as a means of optimizing the rehabilitation approach and identifying potential tailings area closure strategies.

Our current closure strategy incorporates long-term planning and includes the following main objectives:

- Minimizing impacts to the surrounding environment
- Developing aesthetics consistent with the expectations of external stakeholders, including regulators, and the surrounding land, such as farmland and light industrial areas
- Aiming for beneficial reuse of post-closure bauxite residue or mine tailings
- Progressively implementing closure actions during active operations so the success of the closure method is demonstrated and the entire closure burden is not shifted to the end of operations
- Minimizing potential leachate discharge and treatment options

Our early bauxite residue storage areas at the Kwinana alumina refinery serve as an example of returning tailings storage areas to productive land use. Parts of the storage areas were incorporated into the Perth Motorplex in Western Australia, which opened in December 2000. There have been no issues related to managing the site in the context of it being a former bauxite residue storage area.

Our rehabilitation, or revegetation, rate for residue storage areas has remained steady over recent years. We expect to see continued improvement as we progressively close the residue storage areas at the closed Suralco alumina refinery in Suriname and Point Comfort alumina refinery in Texas.



Photo credit: Perth Motorplex

Facility Inventory

In accordance with the Mining and Tailing Safety Initiative, which is a group of investors co-headed by the Church of England and the Swedish Council of Ethics, an inventory of our bauxite mine tailings and bauxite residue storage impoundment facilities is available to the public on our [website](#).

The inventory includes impoundments that are greater than 3.0 hectares (7.4 acres) in area or have a height of at least 2.0 meters (6.6 feet) above the low point of the surrounding grade. Solid waste landfills and in-ground impoundments, such as mine pits, ponds, and drains, are not included.

The database is updated annually, with the next update set for July 2022.



Waste and Spills

3 GOOD HEALTH AND WELL-BEING



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



15 LIFE ON LAND



4 RISK MANAGEMENT



6 ENVIRONMENTAL PERFORMANCE



8 RESPONSIBLE PRODUCTION



In line with the [circular economy](#), we work to reduce or eliminate waste in our operations and keep resources in use for as long as possible.

We first focus on reducing waste generation at the source. We then work to identify and implement reuse and recycling opportunities and manage materials in an environmentally protective manner. This effort has created adjacent revenue streams for our company.

Our waste management hierarchy consists of the following:

- 1. Source reduction:** Reduce the volume or toxicity of waste at the source through changes in industrial processes, material substitution, segregation practices, maintenance activities and more sustainable procurement practices.
- 2. Reuse:** Reuse the waste or industrial byproduct onsite or offsite for its original purpose or for another beneficial purpose.
- 3. Recycling/composting:** Recover value and resources from wastes.
- 4. Energy recovery:** Recover heat value from wastes.
- 5. Treatment/disposal:** Reduce the volume, toxicity or other hazardous characteristics of wastes prior to disposal or discharge. Disposal is the least preferred option for waste management.

Our waste management standard requires all sites to have a waste management plan, an inventory of all waste streams generated onsite, onsite waste storage areas that meet all local regulatory requirements, a comprehensive waste training program, and tracking of non-hazardous and hazardous waste metrics. All sites report their waste metrics into Alcoa's centralized corporate environmental metrics database.

A key component of our waste management plans are the development of strategies to minimize waste. Each location is required to develop a waste minimization plan to support our corporate sustainability goal, focusing on minimization opportunities with an emphasis on reuse,

reduction and recycling. The plan is developed with input from a cross section of disciplines, including operations, maintenance, and procurement. It is reviewed at a maximum of every three years.

In 2021, we launched a focused Waste Optimization Program led by a cross-functional group of employees. After reviewing the results of a comprehensive global waste inventory survey, the team identified 10 focus material types across 17 locations:

- Timber
- Rubber (conveyor and tires)
- Bauxite residue (sand and mud)
- Electrostatic precipitator (ESP) dust
- Oxalate
- Spent pot lining (SPL)
- Refractory
- Carbon
- Bath
- Dross

The Waste Optimization Program focuses on circularity, and the waste minimization hierarchy aims to align and optimize our efforts to achieve our sustainability goal and minimize long-term liabilities across our global locations. The focused approach is challenging us to look beyond traditional land disposal practices and seek opportunities for reuse and repurposing.

In 2021, we continued our collaboration with other mining companies and suppliers via the Tyre Stewardship Australia (TSA) initiative to find reuse and recycling solutions for tires and conveyor belts. We also have implemented some promising work practices that will enable source reduction and reuse of dross material. This will potentially reduce the generation of downstream processing wastes, such as salt cake.

We assess waste generation from our suppliers as part of our Global Supplier Sustainability Program and Supplier Standards (See the [Supply Chain](#) section). In addition to this program, we have a comprehensive assessment process for waste transporters and facilities that receive industrial waste or byproducts from our facilities. The assessments are completed in accordance with our internal standard and designed to confirm third parties manage our waste adequately.

As an integrated bauxite mining, alumina refining and aluminum smelting company, we manage waste along the entire value chain—from bauxite mining to aluminum production and casting.

Our landfilled waste decreased 15.4 percent in 2021 compared to the prior year. This was primarily due to the curtailment of the Intalco smelter.

Certain waste streams, such as bauxite residue, refining process waste and fly ash, are excluded from our landfilled waste data. We manage these materials separately with onsite storage or impoundment areas rather than sending them to landfills. Overburden and rock generated from our mining activities, which are also not included in the data, are not considered waste because the materials are returned for reuse during mine rehabilitation.

Our long-term waste goal focuses on landfilled waste to emphasize reduction at the source and move from landfill disposal to other options, including reduction, reuse and recycling, using the waste management hierarchy.

Our goal is a 15-percent reduction in landfilled waste by 2025 and 25 percent by 2030 from a 2015 baseline. We achieved a 36.0 percent decrease through 2021.

[ERM CVS](#) provided limited assurance of our 2021 waste data. ([View the limited assurance statement.](#))

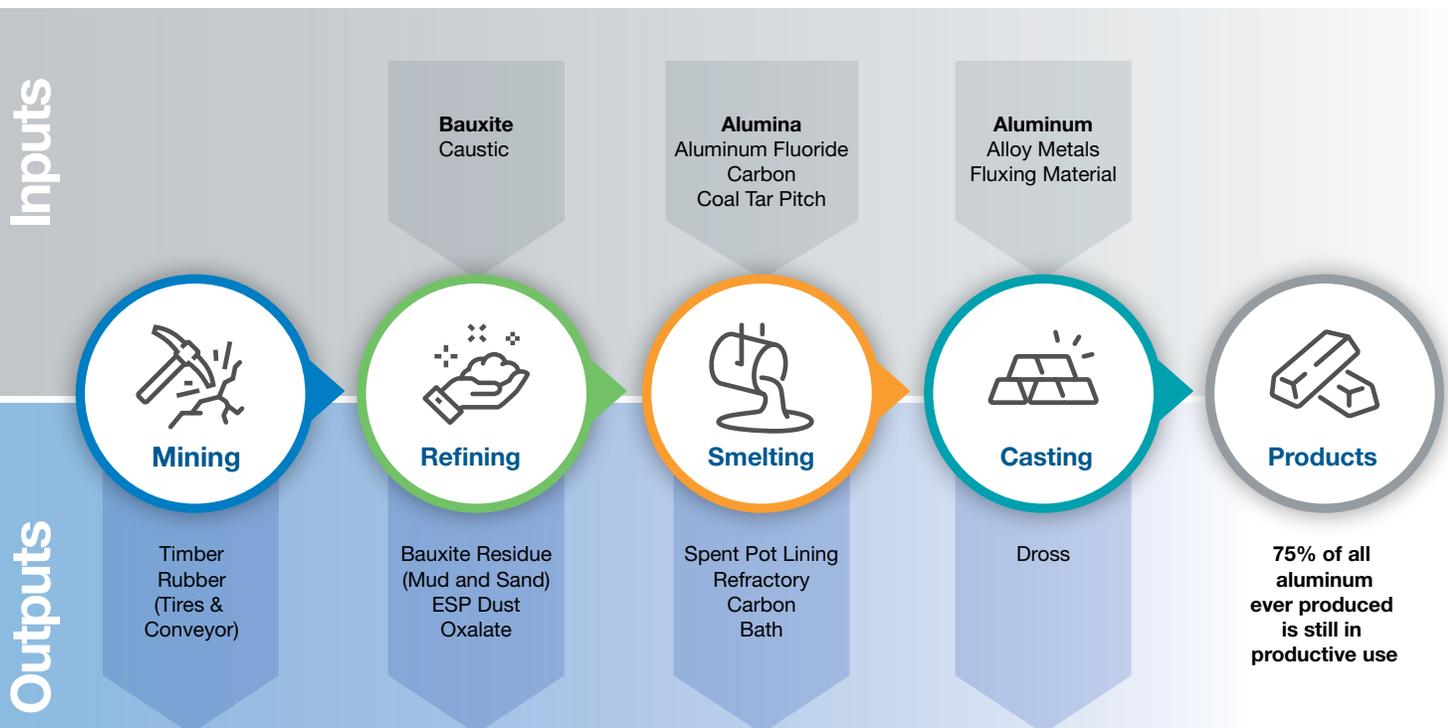
Spent Pot Lining

Spent pot lining (SPL) is the carbon and refractory lining from retired smelting pots.

We focus on reducing the volume of SPL by consistently working on alternative approaches to pot relining and increasing the lifespan of our smelting pots. This reduces the amount of required re-linings and replacements, and therefore, the volume of generated SPL.

We continue to pursue ways to transform our spent pot lining into a raw material or fuel source for other industries. For example, the cement industry uses spent pot lining as both a fuel and raw material. It also can be used as a raw material in the production of steel and a fuel source in the manufacture of rockwool insulation.

We recycle and/or reuse SPL in accordance with applicable country-specific requirements.



Transformation Waste

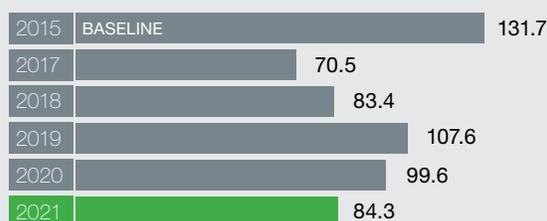
As we continue to transform and optimize our operating portfolio, we decided to separately track and report wastes generated from our Transformation Group, which manages all closed or curtailed operations.

Solutions for waste-management reduction may differ for routinely generated wastes that are typical of operating locations compared to periodically generated wastes, which typically originate in closure and decommissioning activities. The differentiation between the two enables us to prioritize solutions for both.

Our waste-reduction goal focuses on operating locations, but we will reevaluate it in the next two years to verify that the goal's scope and intent remain relevant. (See the [Facility Stewardship and Transformation](#) section.)

Landfilled Waste

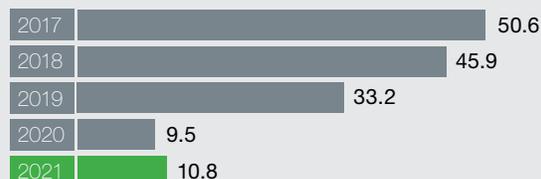
Thousands of metric tons



Historical numbers have been restated to reflect the divestiture of Warrick Rolling.

Spent Pot Lining Recycled/Reused

Percent of spent pot lining generated



The decreases in 2020 and 2021 reflect our internal decision to delay pot digging and/or store SPL for treatment at a later date (where legally permissible) and/or pursue alternative waste management options. Includes SPL generated by the Transformation Group.

2021 Waste Type and Disposal Method

Thousands of metric tons

	Hazardous	Non-Hazardous	Total
Generated	117.1	140.0	257.1
Preparation for reuse	0.1	0.4	0.5
Recycling	57.2	112.2	169.4
Other recovery operations	0.5	0.8	1.3
Landfilling	56.2	28.1	84.3

Bauxite Residue Intensity

Metric tons of residue per metric ton of alumina produced



Total Wastes Recycled, Reused & Other Recovery

Thousands of metric tons



Historical numbers have been restated to reflect the divestiture of Warrick Rolling.

Transformation Waste

Thousands of metric tons

	Landfilled Waste	Total Wastes Recycled, Reused & Other Recovery
2019	32.8	8.6
2020	71.9	28.5
2021	18.5	15.9

Closing the Dross Loop

Through our Dross-to-Pots (D2P) initiative, what was once waste destined for the landfill is now a valuable byproduct rich with aluminum and other elements essential to the aluminum smelting process.

Dross is generated in our casthouses during molten metal treatment and alloying, and it is skimmed off the top of the molten metal prior to it being cast into aluminum ingots. Its composition varies based on the alloying elements added to pure aluminum to meet the finished metal's specifications.

Since its major composition is metallic aluminum and aluminum/magnesium oxides, alloyed dross is a valuable material that is essential for producing aluminum. Our D2P initiative, which is a collaboration between our Baie-Comeau smelter in Canada, our Smelting and Casting Technology team and an external processor, focuses on getting the value back from dross rather than landfilling it.

Historically, alloyed dross' variability from casthouse to casthouse and even within the same casthouse made it difficult or even impossible to reuse the material in making aluminum. For example, dross containing high levels of magnesium oxide and other compounds, such as chlorides and nitrides, may potentially impact pot chemistry and operational stability if not taken care of properly. Through extensive research, our scientists determined the impacts of these compounds and identified adjustments to pot chemistry and process controls to mitigate their effects.

Before alloyed dross can be reused, it has to be processed into a form that can be added to the smelting pot. The external processor crushes and separates the dross into two material streams that are returned to our smelters: aluminum metal that goes back to the casthouse and particles that we blend into anode cover material for the smelting pots.

Currently, our Deschambault and Baie-Comeau locations in Canada are reusing alloyed dross. Our Portland Aluminum smelter in Australia has been reusing pure dross that does not contain alloying elements. The three smelters are diverting approximately 4,500 metric tons of dross from the landfill annually while reducing disposal costs and the use of virgin raw materials.

We plan to extend dross recycling to our other facilities that produce large volumes of the by-product, such as Bécancour in Canada and Mosjøen in Norway.

A smelting pot anode is sealed with cover material containing 3 percent recycled alloyed dross.



Smelter Leaves Smaller Waste Footprint

When we set our global landfill waste goal, our Massena smelter in the U.S. challenged its workforce to find every opportunity to reduce, reuse and recycle. In 2021, their efforts resulted in 5,801 metric tons of waste being diverted from the landfill.

One of the smelter's first steps was forming dedicated and cross-functional waste optimization teams. The teams' approach to circularity includes sharing best practices and gathering input from colleagues around the world to find smarter and more sustainable waste-reduction solutions.

The smelter next developed a multi-year waste management strategy that includes continuous audits and review of all waste streams, from supporting processes to smelting operations. Under the strategy, the waste optimization teams created detailed waste inventories to provide insight about waste streams, volumes generated and costs associated with treatment and disposal to inform new processes and smarter approaches.

Item by item, team members worked through the details and posed questions according to our global hierarchy of waste management — source reduction, reuse, recycling/composting, energy recovery, and lastly, treatment/disposal. In team meetings, they asked each other if items could be reduced through new or different maintenance activities. They explored whether the items could be changed completely through procurement practices. They also investigated if the waste had value elsewhere, perhaps as a new industrial byproduct to be sold to another business.

For the Massena teams, the adage “one person’s trash is another’s treasure” rang true. Spent vapor pot barrier steel was recycled. Improved sorting of spent anode pieces and rod yokes increased returns for recycling. Compaction of loose shipments and bailing cardboard reduced shipments. Wood pallets became an industrial byproduct for a nearby wood pellet business.

In addition to the 5,801 metric tons of diverted waste in 2021, the minimization efforts avoided 427 metric tons of greenhouse gas emissions, conserved more than 160,000 kilowatts of electricity and reduced water consumption by around 300 cubic meters (80,000 gallons) during the year.



Bauxite Residue

In 2021, we generated 23.5 million metric tons of bauxite residue (see the [Impoundment Management](#) section) and recycled zero metric tons. The amount of residue per metric ton of alumina produced continued to remain steady compared to prior years.

Our collaboration with external organizations and universities on residue reuse opportunities continued in 2021.

We are a founding member of the four-year [ReActiv project](#), which launched in late 2020 to transform bauxite residue into a reactive material that is suitable for new cement products that have a low CO2 footprint. The project consortium comprises major cement company LafargeHolcim, seven alumina refineries, two aluminum associations, six universities and research institutes, and five engineering companies from 12 European countries. The European Union has provided US\$10.6 million (€8.8 million) in funding.

Through the Alcoa Foundation, we continue to support research at the University of São Paulo in Brazil that is also focused on using bauxite residue in manufacturing cement. The research has demonstrated that it is technically feasible to replace a portion of

the cement with bauxite residue for diverse types of cementitious products.

In parallel, we are working with the International Aluminium Institute (IAI) to identify potential pathways for the adoption of bauxite residue in cement production and use. IAI released its [technology roadmap](#) in November 2020 to address concerns, prejudices, and technical and legislative barriers to maximizing the use of bauxite residue in the cement industry. A focus for 2021 was understanding the requirements for classifying bauxite residue to provide globally accepted guidance for ensuring its safe transportation.

We are also supporting an IAI project that could rapidly transform in-situ bauxite residue into a soil-like medium, depending on specific criteria. This work is investigating the interactions between chemical, physical and biological drivers of remediation during initial stages of soil formation in bauxite residue. The study has progressed from microbially based remediation strategies that were tested in greenhouse trials to now being tested at field scale, with trial plots established at our Kwinana refinery in Western Australia. In 2021, the project successfully attracted Australian government funding to supplement the next phase of work.

Bauxite Residue Reuse Opportunities

Region	Opportunity
Western Australia	<ul style="list-style-type: none"> • Top dressing • Fill for industrial land development • Road construction • Nutrient management • Soil amendments and conditioners • Clinker/cement manufacture • Brick manufacture • Rare earth and critical mineral extraction • Contaminant immobilization • Geopolymers
United States	<ul style="list-style-type: none"> • Acid mine drainage • Wastewater treatment (artificial wetlands) • Levee construction • Rare earth and critical mineral extraction
Brazil	<ul style="list-style-type: none"> • Clinker/cement manufacture • Back to mine • Brick manufacture • Rare earth and critical mineral extraction
Spain	<ul style="list-style-type: none"> • Clinker/cement manufacture • Rare earth and critical mineral extraction

In addition to these initiatives, we continue to explore potential opportunities to use the coarse sand contained in bauxite residue as a construction material or general fill for land development and the red mud for other purposes.

Secondary Minerals and Materials

Our work to pursue alternative uses and markets for secondary minerals and materials continues to contribute to the circular economy. It also can create additional revenue streams and avoid costs for our company, including expenses associated with landfill disposal.

Secondary materials include items such as carbon, electrolytic bath, fly ash and secondary aluminas. Our Secondary Minerals commercial group is responsible for the sales of these and other minerals and materials. Sales for 2021 included 37,700 metric tons of fly ash from our Alumina location in Brazil; 53,000 metric tons of residual carbon products, such as spent anodes; 37,000 metric tons of alumina dust; and approximately 20,000 metric tons of bath.

We use a three-tiered classification for our secondary materials:

- **Commercial:** Materials sold as a commercial product;
- **Transition:** Materials that have some limited commercial viability or can be placed with a user to derive a better financial outcome than landfilling; and
- **Disposal:** Materials that are typically landfilled or otherwise disposed.

The Secondary Minerals group sold 155,000 metric tons of secondary materials and by-products in 2021, generating nearly US\$21.8 million in value through both revenues and reduced disposal costs.

Spills

We deploy several operational control measures aimed at minimizing the impact of spills on the environment. These controls vary depending upon the nature of the material and the risk presented to the environment.

Control measures include secondary containment, inspection practices, work practices during loading/unloading operations and a variety of technology-based leak detection systems on critical piping and tank systems.

We require any uncontained spill or release of oils, process liquids or solids in excess of 20 liters with a potential environmental impact to be reported internally as an incident, regardless of whether reporting to external agencies is required.

We define major spills as those meeting the criteria for a major on-site or off-site environmental incident designation in the Alcoa Environmental Incident Management System, which includes spills that have the potential to cause significant harm to the environment or community. In 2021, we had zero major spills.

2017	0
2018	1
2019	0
2020	0
2021	0



Water

6 CLEAN WATER AND SANITATION



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



14 LIFE BELOW WATER



6 ENVIRONMENTAL PERFORMANCE





Water is a precious, shared resource. Our stewardship of it is a fundamental, material issue for our stakeholders and an important element in our [sustainability approach](#).

Water is also a critical raw material in our operations, particularly for ore processing, cooling, casting, dust suppression and potable uses.

Our priorities for water management are outlined in our [Water Stewardship Policy](#). The policy is supported by our Water and Wastewater Management Standard, which is aligned with the International Council on Mining and Metals (ICMM) [Position Statement](#) on Water Stewardship.

We developed our water disclosure and accounting in accordance with ICMM Water Reporting Good Practice Guide, 2nd Edition, which was released in August 2021. We are currently updating our water accounting processes to align with the new ICMM reporting requirements required for disclosure by 2023.

In accordance with our Water and Wastewater Management Standard, our locations continued developing location-specific water management plans that consider the following:

- Climate change and water stress
- Current and alternative water sources
- Water quality
- Security of water supplies
- Water reduction, substitution, reuse and recycling programs
- Risks of contamination of water resources and mitigating actions, considering local context and receiving water bodies
- Other water impacts, such as erosion, acidification and salination

Each location must develop an action plan for higher-risk aspects, with the plan reviewed and updated at least every five years.

Our Water and Wastewater Management Standard also requires a documented water balance for each location that is reviewed and updated at least every five years; a risk-based monitoring program; access to safe, high-quality potable water; and wastewater treatment facilities that are operated and maintained in accordance with permit conditions and standard industry practices. In greenfield expansions, where no local discharge requirements exist, the standard requires that senior leadership adopt and approve limits and thresholds that are consistent with international standards, ensuring protection of the surrounding community and environment.

As part of our long-term planning process, our operations are required to maintain water use forecasts that consider relevant risks and opportunities. Also, our Global Capital Management System evaluates water consumption impacts, both in quantity and quality, for proposed capital projects.

In 2018, we applied the World Resource Institute's [Aqueduct tools](#) to inform our identification of water-scarce locations and refined our classification through a qualitative risk assessment, which considered items such as local applicable requirements and local supply/demand needs.

Locations meeting our definition of water-scarce locations are the Alumar refinery in São Luís, Brazil, the Huntly and Willowdale mines in Western Australia, and the Kwinana, Pinjarra and Wagerup refineries, also in Western Australia. These represented 29 percent of our locations in 2021. We classified all other facilities as having low-to-medium or low baseline water stress. Review of our water stress assessment is a key focus area for 2022.

Recognizing water scarcity as a significant risk, our long-term goal is to reduce the intensity of our total water use from Alcoa-defined water-scarce locations by five percent by 2025 and 10 percent by 2030 from a 2015 baseline. We achieved a 0.8 percent reduction against the baseline through 2021. While total water use at water scarce facilities decreased in 2021 compared to 2020, lower production at Pinjarra and Alumar refineries resulted in a higher water use intensity.

We encourage all locations, even those in water-rich areas, to look for ways to reduce consumption and discharge, use fit-for-purpose sources of water, and increase recycling and other opportunities through advanced technologies and process improvements.

Our Kwinana and Pinjarra refineries in Western Australia, for example, have the capability to reduce their freshwater use by a collective 2.2 gigaliters (581 million gallons) annually through an innovative technology called residue filtration. This is equivalent to the amount of water needed to fill 880 Olympic-sized swimming pools. (See the [Impoundment Management](#) section.) In 2021, we started on a project to bring press filtration to our Poços de Caldas refinery in Brazil.

In addition to our internal water initiatives, our locations actively engage with government agencies and non-governmental organizations focused on water quality and conservation. Some of our employees serve on local water boards and committees, while others volunteer their time for specific projects. We also provide financial support for water-based community initiatives, primarily through Alcoa Foundation.

We manage all water discharges in accordance with location standards and regulatory requirements. In 2021, we had one non-compliance associated with water-quality permits, standards and regulations that resulted in a formal enforcement action.

Water Use

Our power stations, refineries and casthouses are our largest users of water. Surface water is our highest volume withdrawal at 88 percent of total water withdrawn, and it is also our highest-volume discharge at 87 percent of total water discharged. Within our operations, the main consumptive water uses are evaporation from tanks, vents and storage, entrainment in bauxite mine tailings and uses within our casting locations.

In some countries, such as Canada, Iceland, Norway and parts of the United States, water is plentiful and even powers some of our smelters via hydroelectric dams. The situation is markedly different, however, for our operations in Western Australia, where the drying climate is a challenge. In Brazil, we manage our water use to account for high seasonal variation in rainfall.

At locations where water is scarce, our teams recycle and reuse water multiple times until it is lost to evaporation or entrainment as part of the process. Minimal discharges occur at these sites. Other facilities, including our Warrick power station in the United States and smelters in Norway, discharge most of the water they withdraw for non-contact cooling purposes. In these cases, the water returns to the same source from which it was withdrawn.

Our total water use in 2021 was 835.1 million cubic meters, which was a 3.7 percent decrease compared to 2020. Our water withdrawal decreased 3.0 percent over the prior year to 840.4 million cubic meters and we recycled or reused 165.8 million cubic meters of water. Our total outputs (discharge and consumption) also decreased by 3.8 percent. Refinement in the water accounting at our Warrick and Juruti operations resulted in a change in the outputs balance between discharge and consumption. Water discharges decreased by 4.2 percent to 778.3 million cubic meters and water consumption increased by 2.3 percent to 56.4 million cubic meters.

Our Alcoa-defined water-scarce locations account for 5.3 percent of Alcoa's total water use with 44.3 million cubic meters used in 2021, a 0.3 percent decrease compared to 2020. Alcoa-defined water-scarce locations recycled 144.9 million cubic meters of water in 2021. High quality water withdrawal as a percentage of total high quality water withdrawn was 3.4 percent, and high quality water consumption as a percentage of total high quality water consumption was 56.4 percent.

[ERM CVS](#) provided limited assurance of our 2021 water use data. ([View the limited assurance statement.](#))



At our Fjarðaál, Iceland location, stormwater is treated sustainably and cost-effectively.

Case Study

Freshwater Reuse in Brazil

From reusing a brewery’s wastewater to storing rainwater from the wet season for use in the dry season, our Alumar location in Brazil reduced its freshwater consumption by 30 percent in two years.

The location realigned its cross-functional Water Balance Team in 2020 to capture reuse opportunities. Recent actions and the amount of freshwater saved in 2021 include:

- Decreasing the amount of groundwater withdrawn by reusing the wastewater from a nearby brewery, which previously discharged the treated water to a local river (665,000 cubic meters)
- Reusing 100 percent of the plant’s sanitary wastewater (600,000 cubic meters)
- Pumping runoff water from a bauxite residue storage area and leachate from an onsite landfill pond to the refinery for reuse in the cooling systems. This also eliminated the need to chemically treat the wastewater, which the site previously discharged to a local water body post-treatment. (Approximately 120,000 cubic meters)
- Storing rainwater collected in the wet season in bauxite residue areas, operational lakes and a freshwater lake for reuse in the dry season (410,000 cubic meters)

In addition to the 30-percent reduction in freshwater consumption since 2019, the reuse initiatives saved more than US\$90,000 in water treatment costs in 2021 and reduced the environmental impacts of Alumar and the brewery through reuse of their discharged effluents.

The location’s efforts, which received our internal EHS Excellence Award in 2021, have been shared with our locations globally.



Stored rainwater

Freshwater Use Intensity

Cubic meters of water per metric ton of primary aluminum produced



Freshwater use reflects only fresh water used to directly manufacture products. It excludes rainwater to encourage reuse of alternative sources and large volume, once-through water usage from our energy facilities. The intensity data represents the combined impact of refining, smelting and casting indexed to metric tons of primary aluminum production (refining is included at a ratio of 1.9 metric tons of alumina to 1.0 metric tons of smelted aluminum). Historical numbers have been restated to reflect the divestiture of Warrick Rolling.

Total Water-use Intensity—Locations in Alcoa-defined Water-scarce Areas

Cubic meters of water per metric ton of alumina produced



The intensity data represents the combined impact of mining and refining operations in water-stressed areas indexed to metric tons of alumina production (mining is included at a ratio of 2.85 metric tons of bauxite to 1.0 metric tons of alumina). Total water use includes all withdrawals and the change in storage to reflect years when water is used within our process.



2021 Water Balance

Million cubic meters

	Source/Destination/Type	Volume of Water by Quality			Total
		High		Low	
		Category 1	Category 2	Category 3	
All Sites					
Operational Water Withdrawal (Inputs)	Surface Water	37.0	681.2	19.3	737.5
	Groundwater	6.6	12.7	3.7	23.1
	Seawater	0.0	0.0	69.5	69.5
	Third-party Water	2.4	4.8	3.0	10.2
	Total	46.0	698.8	95.6	840.4
Operational Water Discharge (Outputs)	Surface Water	1.9	676.2	0.2	678.2
	Groundwater	0.0	1.1	3.7	4.9
	Seawater	0.0	0.4	92.5	92.9
	Third-party Water	1.9	–	0.4	2.3
Operational Consumption (Outputs)	Evaporation	6.7	10.9	22.8	40.3
	Entrainment	–	0.0	16.1	16.1
	Total	10.4	688.6	135.6	834.7
Operational Water Reuse/Recycle					165.8
Operational Water Use					994.4
Change in Storage (delta storage)					5.3

Locations in Alcoa-defined Water-scarce Areas

Operational Water Withdrawal (Inputs)	Surface Water	7.6	1.6	19.3	28.6
	Groundwater	0.2	12.6	3.3	16.1
	Seawater	0.0	0.0	0.0	–
	Third-party Water	0.8	2.5	1.3	4.7
	Total	8.7	16.8	23.9	49.3
Operational Water Discharge (Outputs)	Surface Water	0.3	0.3	–	0.6
	Groundwater	0.0	1.1	0.0	1.1
	Seawater	0.0	0.3	0.0	0.3
	Third-party Water	0.0	0.0	0.0	0.0
Operational Consumption (Outputs)	Evaporation	6.1	3.8	20.3	30.2
	Entrainment	–	–	11.5	11.5
	Total	6.4	5.6	31.9	43.8
Operational Water Reuse/Recycle					144.9
Operational Water Use					188.8
Change in Storage (delta storage)					5.0

We report water quality in accordance with the Minerals Council of Australia's [Water Accounting Framework](#). Category 1 water is of a high quality and suitable for most purposes with little or no treatment. Category 2 water is of a medium quality and suitable for some purposes, such as irrigation. Category 3 water is of a low quality and suitable for limited purposes without significant treatment. Categories 1 and 2 are equivalent to the ICMM High Quality definition, and Category 3 is equivalent to the ICMM Low Quality definition. Groundwater includes produced water, which is water entrained in ore. In 2021, high-quality water withdrawals were 51.6 percent of total water inputs for Alcoa-defined water-scarce locations. The sum of categories may vary from the totals due to rounding. To convert unit of measure from million cubic meters to thousands of cubic meters, multiply the data by 1,000.

During a review of the 2020 water balance, we made modifications to improve data accuracy. Total Water Outputs remained at 867.4 million cubic meters. Water Discharges changed from 748.8 to 812.3 million cubic meters, and Water Consumption changed from 118.7 to 55.1 million cubic meters. Surface Water remained our highest volume output at 81 percent of total water outputs and 87 percent of total water discharged.

2021 Water Balance

Million cubic meters

Water Withdrawal

Surface Water	737.5
Groundwater	23.1
Seawater	69.5
Third-party Water	10.2

840.4



Operational Water Use

994.4



165.8
Operational
Water Reuse/
Recycle



5.3
Change in
Storage
(delta storage)

Water Discharge and Consumption

Surface Water	678.2
Groundwater	4.9
Seawater	92.9
Third-party Water	2.3
Consumption	
<i>Evaporation</i>	40.3
<i>Entrainment</i>	16.1

834.7

Air Emissions

9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



W

e define and implement internal standards to meet or exceed all applicable air emission regulations in the jurisdictions where we operate. We also work to minimize all releases in a cost-effective manner.

The type of air emissions are defined by the specific manufacturing processes at our facilities. Most sulfur dioxide and fluoride emissions, for example, come from our smelting operations, while our alumina refineries account for most mercury emissions. Greenhouse gases are emitted from both our smelting and refining operations. (See the [Climate Protection](#) section for a discussion on GHGs and the [Value Creation Process](#) section for a listing of emissions by process.)

We use industry-leading technologies to control mercury emissions in the alumina refining process. Alcoa developed two primary mercury emission-reduction technologies in collaboration with leading academics and experts. The first condenses elemental mercury from gas streams, allowing controlled separation and safe disposal. The second technology is a patented process that stabilizes the mercury during processes where it could otherwise be emitted. We apply our knowledge and these technologies at all locations to reduce the emissions of mercury.

In this report, we provide data on specific emissions based on their materiality across our global operations. These emissions include mercury, fluoride, nitrogen oxide, sulfur dioxide and volatile organic compound (VOC) emissions. Other emissions, such as carbon monoxide and particulate matter, are relevant only at certain locations and are therefore monitored at the location level. This information is available upon request. Lead emissions are not material for our operations.



Mercury Emissions Intensity

Grams per thousand metric tons of alumina produced



Mercury Emissions

Thousands of kilograms



The increase in 2018 was the result of higher levels of naturally occurring mercury within the bauxite we consume and one location updating estimated data.

Fluoride Emissions Intensity

Kilograms per metric ton of primary aluminum produced



Nitrogen Oxide Emissions

Thousands of metric tons



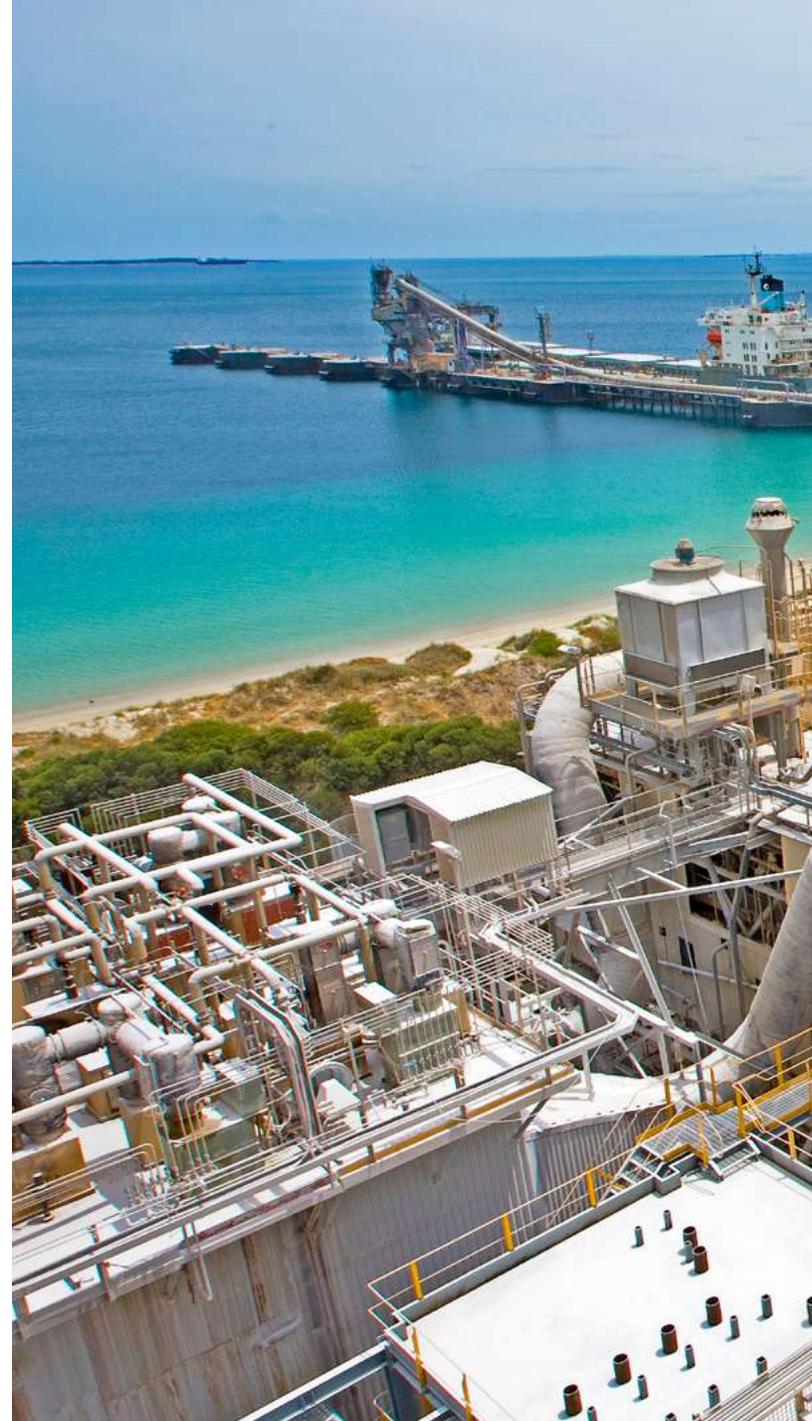
Historical numbers have been restated to reflect the divestiture of Warrick Rolling.

Sulfur Dioxide Emissions

Thousands of metric tons



The increase in 2020 was due to increased production at several locations.



Volatile Organic Compounds Emissions (Refining Operations Only)

Metric tons



To support Alcoa's efforts to continuously improve reporting transparency and completeness, we embarked on an effort to collect data from the refining operations. These data are reported above.



Fugitive Emissions

Fugitive emissions, such as dust, are those that cannot reasonably be emitted or released through a chimney, stack or vent and may leave a site's property boundary.

Controls to manage or minimize fugitive emissions from our mining and process operations include:

- Watering haul roads and bauxite residue areas, using binders on storage piles and incorporating vegetative covers where possible to minimize windblown dust
- Using weather forecasts to help guide decisions regarding the use of additional controls during periods of unfavorable weather conditions
- Implementing capture and control systems for loading/unloading, material handling, smelting and other process operations

We frequently employ visual emission observation and ambient-air monitoring tools to verify the effectiveness of these controls.

Environmental Compliance





Wherever we operate, we adhere to all applicable environmental laws and regulations. In certain cases, our internal standards may be more stringent than what is required in specific jurisdictions.

Our Environment, Health and Safety (EHS) Compliance Committee comprises leaders from Internal Audit, Ethics and Compliance, Legal, and EHS. It monitors EHS compliance-related matters to ensure that the appropriate level of oversight is in place depending on risk level. We also conduct a quarterly compliance review that includes our Chief Executive Officer, Chief Financial Officer and General Counsel.

Our environmental compliance tracking system enables us to rapidly correct actual and potential incidents. This includes a robust review process to confirm that permit applications, including both draft and final permits, are effectively reviewed before being submitted in accordance with regulatory requirements.

We encourage reporting of all deviations within our operations, no matter how small, so we can continuously improve.

Environmental compliance assessments are integrated into our risk-based EHS assessment process. We conduct these based on operational risks, and each is customized to address a location's current needs and challenges. The assessment team is composed of internal and/or external subject matter experts and collaborates with our locations.

Despite ongoing travel challenges and restrictions presented by the global COVID-19 pandemic, we were able to continue our compliance assessment process in 2021 using both remote methods and onsite visits, where permitted.

We also actively engage in regulatory and rulemaking processes at all levels of government. We advocate through direct communication with community stakeholders and via regional aluminum associations and industry partnerships on shared issues at various regulatory levels, including national, regional and local. Our objective is to work collaboratively so major rulemaking is effective and will meet the needs of society.

As part of our regulatory development process, we monitor risks and potential impacts to our business. This process includes assessing the timeframe available to contribute to a regulatory development so we can appropriately engage with those stakeholders associated with the rulemaking process.

In 2021, we had one non-compliance issue related to water management at our Warrick facility that resulted in a penalty. We also paid penalties for four minor water exceedances that occurred in 2020 at a curtailed North Carolina facility.

Environmental Non-Compliances

	Total	Significant	Penalties (U.S. dollars)
2017	5	0	81,860
2018	3	0	141,207
2019	5	0	70,500
2020	4	0	70,200
2021	1	0	12,240

The 2021 penalties amount includes penalties for four minor water exceedances that occurred in 2020 but were paid in 2021. We define a significant non-compliance as receiving a fine or penalty exceeding US\$100,000.

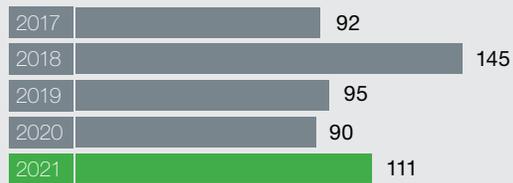
Environmental Capital Expenditures

Our annual environmental capital expenditures vary based on the number and type of projects implemented. In 2021, we spent approximately US\$111 million in projects that primarily focused on improving bauxite residue management.

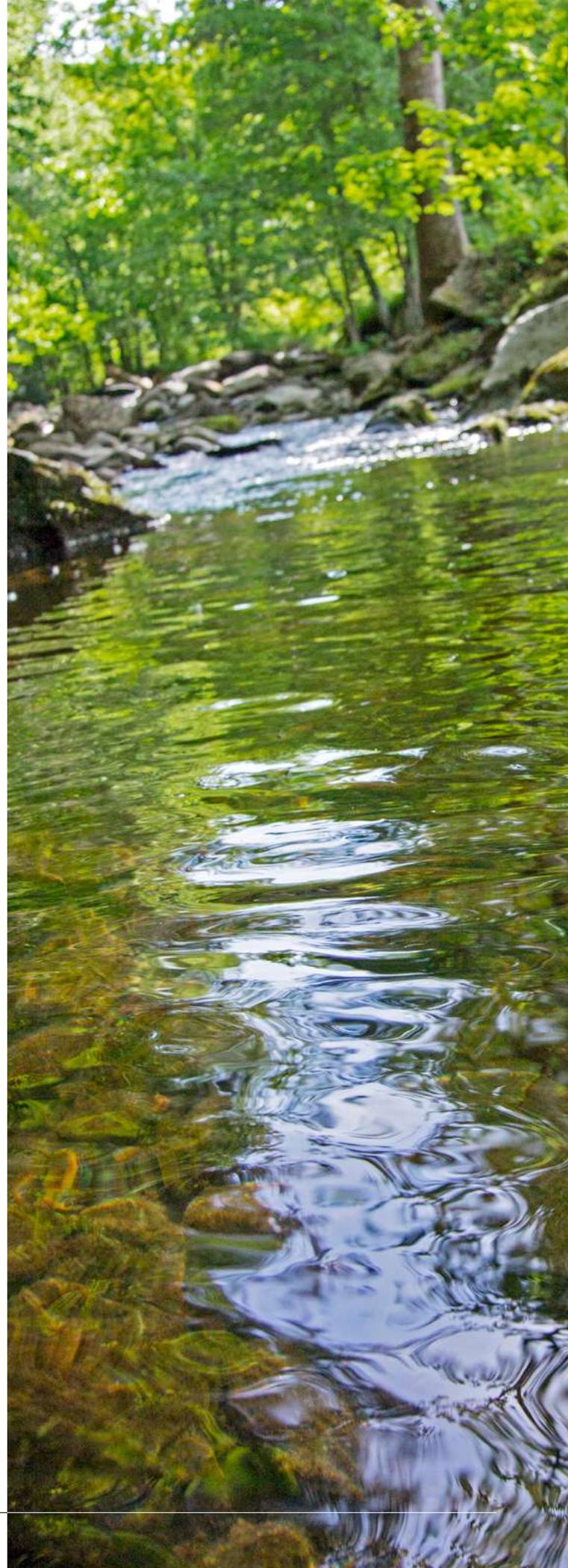
Members of our corporate EHS staff review any capital expenditure request that exceeds US\$2 million, regardless of whether it is being designed as an environmental improvement project. The review is meant to ensure that the work incorporates best EHS practices and that the final project will minimize additional environmental impact.

Environmental Capital Expenditures

Millions of U.S. dollars



Increase in 2018 was due to the implementation of a residue filtration project in Australia.



Awards and Recognitions

Location/Business	Award Name	Name of Granting Organization
Iceland – Fjarðaál	Company of the Year Award	Hinsegin Austurland (East-Iceland LGBTQ+ organization)
Canada	CN Safe Handling Award 2021	CN (Canadian National Railroad)
Canada – Baie-Comeau	Closed Loop Residue Work	
Canada – Deschambault	Best Aluminum Paper — Jayson Tessier, Patrice Doiron, Simon Beaulieu, Mark Rheaume and Claude Gauthier	International Committee for Study of Bauxite, Alumina and Aluminium
Alcoa of Australia	Employer of Choice for Gender Equality (19th consecutive year)	Workplace Gender Equality Agency
Alcoa of Australia	Bronze Tier Employer (eight consecutive year for either silver or bronze tier)—Pride in Diversity	Australian Workplace Equality Index
Australia – Willowdale	Meritorious Community Service Award – Shire of Waroona Trish Morris, PEACH (Personnel Employed at Alcoa Charity Help) President, Western Australian Operations; Executive Assistant, Willowdale Mine	
Australia–Wagerup	WorldSkills Australia National Champion – Brody Stallard, Fabricator and Welder, Wagerup Refinery	WorldSkills Australia
Brazil–Alumar	Brazil 2021 Protection Excellence Award	Proteção Publicações e Eventos
Brazil–Alumar	University Clapping	Federal University of Maranhão
Brazil–Alumar	Port + Brazil	Ministry of Infrastructure (Minfra, Brazil)
Brazil–Alumar	23rd Excellence Award of the Mining-Metallurgy Industry 2021	“Minérios e Minerais” Magazine
Brazil–Alcoa Brazil	2021 Diversity Exam Guide	Reviste Exame
Brazil–Alcoa Brazil	Best Company to work for – Brazil – 2021 (companies with 1,000 to 9,999 employees)	Great Place To Work (GPTW) e Época Negócios

2021 Awards and Recognition

Location/Business	Award Name	Name of Granting Organization
Global	Dow Jones Sustainable North American Index. Listed since 1999	Dow Jones Sustainable North American Index
	Top 100 World's Most Admired Companies	Fortune Magazine
	2021 Industry Leadership Award, Mining and Raw Materials	S&P Global Platts
	2021 Lifetime Achievement Award, Dave DeYoung	S&P Global Platts
	Bloomberg Gender Equality Index	Bloomberg Gender Equality Index
	Corporate Equality Index	Human Rights Campaign

Content Index

This index helps readers compare the information from our sustainability report, annual report and website with the [Global Reporting Initiative GRI Standards](#), [Sustainability Accounting Standards Board Standards \(SASB\)](#), [United Nations Sustainable Development Goals \(SDGs\)](#) and the [International Council for Mining and Metals \(ICMM\) 10 Principles](#).

This report has been prepared in accordance with the GRI Standards 2021.

General Disclosures 2021

GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle
Organization and Reporting Practices					
2-1	Organizational details	Headquartered in Pittsburgh, Pennsylvania, Alcoa Corporation was formed in 2016 under the laws of the State of Delaware, Alcoa Corporation is a publicly traded company listed on the New York Stock Exchange (NYSE: AA). Locations Corporate Overview	EM-MM-510a.2		
2-2	Entities included in the organization's sustainability reporting	Annual Report (All entities included in the consolidated financial statements are included in the sustainability report. Page 72 explains the principles of consolidation, and exhibit 21.1 includes a list of significant subsidiaries.) Corporate Overview Reporting and Materiality			
2-3	Reporting period, frequency and contact point	This report covers 2021 activities. We publish an annual report and a sustainability report for each calendar year. Rosa Garcia Piñeiro Vice President, Sustainability			

General Disclosures 2021

GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle
2-4	Restatements of information	Changes in reporting from prior year are indicated throughout the report			
2-5	External assurance	Reporting and Materiality ERM CVS Limited Assurance Statement			Assurance and Validation
Activities and Workers					
2-6	Activities, value chain and other business relationships	What We Do Value Creation Process Products Recycling Supply Chain Annual Report Quarterly Reports Periodic Reports News Releases	EM-MM.000.A EM-MM.000.B	8, 11	10
2-7	Employees	Our People	EM-MM.000.B	5, 10	
2-8	Workers who are not employees	Our People	EM-MM.000.B		
Governance					
2-9	Governance structure and composition	Board of Directors Board Committees 2022 Proxy Statement Governance, Ethics and Compliance	EM-MM-510a.1		1
2-10	Nomination and selection of the highest governance body	Governance and Nominating Committee 2022 Proxy Statement (page 24)			
2-11	Chair of the highest governance body	2022 Proxy Statement (page 6) The chairman of the board at the end of 2021 was Steven W. Williams.			
2-12	Role of the highest governance body in overseeing the management of impacts	Board of Directors Officers Safety, Sustainability and Public Issues Committee Audit Committee			

General Disclosures 2021

GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle
2-13	Delegation of responsibility for managing impacts	<p>Alcoa's CEO, who reports to and is a member of the Board of Directors, has ultimate responsibility for economic, environmental and social topics.</p> <p>The chief financial officer is responsible for economic topics, and the vice presidents for environment, health and safety, sustainability and human resources have responsibility for environmental and social topics.</p> <p>Safety, Sustainability and Public Issues Committee Stakeholder and Community Engagement</p>		5, 8, 12	2
2-14	Role of the highest governance body in sustainability reporting	Alcoa Corporation's Board of Directors and its committees review impacts, risks and opportunities at regularly scheduled board/committee meetings. The Board of Directors does not have an active role in the sustainability report's development. Senior leaders are responsible for the report's content.			2, 9
2-15	Conflicts of interest	<p>Governance and Nominating Committee Corporate Governance Ethics and Compliance Annual Report 2022 Proxy Statement (pages 23 and 37)</p>	EM-MM-510a.1		1

General Disclosures 2021

GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle
2-16	Communication of critical concerns	<p>Stockholders and employees can communicate any concerns to Alcoa's Board of Directors through:</p> <ul style="list-style-type: none"> • Regular mail, addressed to Chairman of the Board, c/o Alcoa Corporation, 201 Isabella Street, Suite 500, Pittsburgh, PA 15212-5858, USA; • Regular mail, addressed to Audit Committee, c/o Alcoa Corporation, 201 Isabella Street, Suite 500, Pittsburgh, PA 15212-5858, USA; • Integrity Line; • Stockholder resolutions; • Stockholder recommendations for director nominees; and • Union representation or work councils. 			1, 3
2-17	Collective knowledge of the highest governance body	Board of Directors			2
2-18	Evaluation of the performance of the highest governance body	<p>2022 Proxy Statement (pages 30-31)</p> <p>The Board of Directors annually assesses the effectiveness of the full board, the operations of its committees and the contributions of directors.</p>			
2-19	Remuneration policies	2022 Proxy Statement (pages 26 and 45)			
2-20	Process to determine remuneration	2022 Proxy Statement (pages 45 – 56)			
2-21	Annual total compensation ratio	<p>We report the global ratio only.</p> <p>2022 Proxy Statement (page 75)</p>			

General Disclosures 2021

GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle
Strategy, Policies and Practices					
2-22	Statement on sustainable development strategy	From the CEO			
2-23	Policy commitments	Alcoa Values Human Rights Global Sustainability and EHS Policies Code of Conduct Ethics and Compliance Alcoa supports the precautionary principle. Consistent with that principle, we advocate a risk-based approach to our operations through our extensive management systems.	EM-MM-510a.1	5, 8	1, 3, 4
2-24	Embedding policy commitments				
2-25	Processes to remediate negative impacts				
2-26	Mechanisms for seeking advice and raising concerns	Ethics and Compliance Integrity Line			1
2-27	Compliance with laws and regulations	Governance Environmental Compliance			
2-28	Membership associations	Stakeholder and Community Engagement		17	10
Stakeholder Engagement					
2-29	Approach to stakeholder engagement	Stakeholder and Community Engagement	EM-MM-210b.1; EM-MM-310a.2	17	9, 10
2-30	Collective bargaining agreements	Our People Annual Report (pages 11)	EM-MM-310a.1	8	3

Material Topics

GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle
GRI 201: Economic Performance 2016					
3-3	Management of material topic	Annual Report			
201-1	Direct economic value generated and distributed	Shared Value Creation	EM-MM-210b.1	1, 3, 4, 5, 6, 8, 10, 17	9
201-2	Financial implications and other risks and opportunities due to climate change	Climate Protection		13	4, 6
201-3	Defined benefit plan obligations and other retirement plans	Annual Report (pages 105)			
GRI 302: Energy 2016					
3-3	Management of material topic	Energy			
302-1	Energy consumption within the organization	Energy	EM-MM-130a.1 We do not purchase credits or certify specific renewable energy sources but will evaluate the feasibility in the future.	7, 9, 12, 13	6
302-2	Energy consumption outside of the organization	Energy		7, 9, 12, 13	6
302-3	Energy intensity	Energy		7, 9, 12, 13	6
302-4	Reduction of energy consumption	Energy		7, 9, 12, 13	6
302-5	Reductions in energy requirements of products and services	Products Climate Protection Recycling		7, 9, 12, 13	6
GRI 303: Water and Effluents 2018					
3-3	Management of material topic	Water			
303-1	Interactions with water as a shared resource	Water		6, 12, 14	6
303-2	Management of water discharge-related impacts	Water	EM-MM-140a.2	6, 12, 14	6
303-3	Water withdrawal	Water	EM-MM-140a.1	6, 9, 12, 14	6

Material Topics

GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle
303-4	Water discharge	Water	EM-MM-140a.1	6, 9, 12, 14	6
303-5	Water consumption	Water	EM-MM-140a.1	6, 9, 12, 14	6
GRI 304: Biodiversity 2016					
3-3	Management of material topic	Biodiversity and Mine Rehabilitation			
304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	Biodiversity and Mine Rehabilitation	EM-MM-160a.3	15	7
304-2	Significant impacts of activities, products, and services on biodiversity	Biodiversity and Mine Rehabilitation	EM-MM-160a.1	14, 15	6, 7
304-3	Habitats protected or restored	Biodiversity and Mine Rehabilitation		14, 15	7
304-4	IUCN Red List species and national conservation list species with habitats in areas affected by operations	Biodiversity and Mine Rehabilitation	EM-MM-160a.3	14, 15	7
GRI 305: Emissions 2016					
3-3	Management of material topic	Climate Protection Emissions			
305-1	Direct (Scope 1) GHG emissions	Climate Protection	EM-MM-110a.1 EM-MM-110a.2	9, 13	6
305-2	Energy indirect (Scope 2) GHG emissions	Climate Protection		9, 13	6
305-3	Other indirect (Scope 3) GHG emissions	Climate Protection		9, 12, 13	6
305-4	GHG emissions intensity	Climate Protection		9, 12, 13	6
305-5	Reduction of GHG emissions	Climate Protection Recycling		9, 12, 13	6
305-6	Emissions of ozone-depleting substances (ODS)	We use halon gas as a fire suppressant in several locations throughout the world, and we are phasing out these remaining systems as they expire or are used.		3, 9, 12, 13	6

Material Topics

GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle
305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	Air Emissions	EM-MM-120a.1 Carbon monoxide and particulate matter are relevant only at certain locations and are therefore monitored at the location level. This information is available upon request. Lead is not material for our operations.	9, 12	6
GRI 306: Waste 2020					
3-3	Management of material topic	Waste and Spills Recycling			
306-1	Waste generation and significant waste-related impacts	Waste and Spills Recycling	EM-MM-150a.4		
306-2	Management of significant waste-related impacts	Waste and Spills Recycling	EM-MM-150a.10		
306-3	Waste generated	Waste and Spills Recycling	EM-MM-150a.1, EM-MM-150a.4	3, 12, 15	6, 8
306-4	Waste diverted from disposal	Waste and Spills Recycling			
306-5	Waste directed to disposal	Waste and Spills Recycling			
	Total weight of hazardous waste generated	Waste and Spills Recycling	EM-MM-150a.7		
	Total weight of hazardous waste recycled	Waste and Spills Recycling	EM-MM-150a.8		
GRI 307: Environmental Compliance 2016					
3-3	Management of material topic	Environmental Compliance			
307-1	Non-compliance with environmental laws and regulations	Environmental Compliance	EM-MM-140a.2, EM-MM-150a.9	12	6
GRI 403: Occupational Health and Safety 2018					
3-3	Management of material topic	Safety and Health			

Material Topics

GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle
403-1	Occupational health and safety management system	Safety and Health		3, 8	5
403-2	Hazard identification, risk assessment, and incident investigation	Safety and Health		3, 8	5
403-3	Occupational health services	Safety and Health		3, 8	5
403-4	Worker participation, consultation, and communication on occupational health and safety	Safety and Health		3, 8	5
403-5	Worker training on occupational health and safety	Safety and Health	EM-MM-320a.1	3, 8	5
403-6	Promotion of worker health	Safety and Health		3, 8	5
403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	Safety and Health			5
403-8	Workers covered by an occupational health and safety management system	Safety and Health		3, 8	5
403-9	Work-related injuries	Safety and Health	EM-MM-320a.1	3, 8	5
403-10	Work-related ill health	Safety and Health		3, 8	5
GRI 411: Rights of Indigenous Peoples 2016					
3-3	Management of material topic	Human Rights			
411-1	Incidents of violations involving rights of indigenous peoples	Human Rights	EM-MM-210a.3	16	3
GRI 412: Human Rights Assessment 2016					
3-3	Management of material topic	Human Rights			
412-1	Operations that have been subject to human rights reviews or impact assessments	Human Rights	EM-MM-210a.3	5, 8, 10, 16	3

Material Topics

GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle
GRI 413: Local Communities 2016					
3-3	Management of material topic	Stakeholder and Community Engagement			
413-1	Operations with local community engagement, impact assessments and development programs	Stakeholder and Community Engagement Alcoa Foundation Annual Report	EM-MM-210b.1 EM-MM-210b.2 We did not experience any non-technical delays related to our mining projects in 2020. We have obtained permits to access new areas in our Juruti mine in Brazil and engaged with different stakeholders in Australia to renew our environmental permits.	17	10

Mining and Metals Sector Supplement Disclosures

GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle
MM1	Amount of land (owned or leased, and managed for production activities or extractive use) disturbed or rehabilitated	Biodiversity and Mine Rehabilitation		6, 13, 14, 15	7
MM2	The number and percentage of total sites identified as requiring biodiversity management plans according to stated criteria, and the number (percentage) of those sites with plans in place	Biodiversity and Mine Rehabilitation		6, 13, 14, 15	7

Mining and Metals Sector Supplement Disclosures

GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle
MM3	Total amounts of overburden, rock, tailings, and sludges and their associated risks	Impoundment Management Waste and Spills Biodiversity and Mine Rehabilitation	EM-MM-150a.1 EM-MM-150a.2 We do not collect this data on a global basis. EM-MM-150a.3 We have not broken down our impoundments by MSHAS hazard potential EM-MM-150a.5; EM-MM-150a.6 is not applicable as there is no waste rock generated; it is reused in landscaping for mine rehabilitation EM-MM-540a.1; EM-MM-540a.2;	6, 14, 15	4, 6
MM4	Number of strikes and lockouts exceeding one week's duration, by country	One strike in Spain in 2020.	EM-MM-310a.2	8	3
MM5	Total number of operations taking place in or adjacent to indigenous peoples' territories, and number and percentage of operations or sites where there are formal agreements with Indigenous Peoples' communities	Human Rights		8	3
MM6	Number and description of significant disputes relating to land use, customary rights of local communities and indigenous peoples	Stakeholder and Community Engagement	EM-MM-210a.3	17	3, 10

Mining and Metals Sector Supplement Disclosures

GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle
MM7	The extent to which grievance mechanisms were used to resolve disputes relating to land use, customary rights of local communities and indigenous peoples, and the outcomes.	Stakeholder and Community Engagement		17	3, 10
MM8	Number (and percentage) of company operating sites where artisanal and small-scale mining takes place on, or adjacent to, the site; the associated risks and the actions taken to manage and mitigate these risks.	Due to the minimal artisanal and small-scale mining on Alcoa sites worldwide, there is not a formal corporate policy. Action is taken on a case-by-case basis.			
MM9	Sites where resettlements took place, the number of households resettled in each, and how their livelihoods were affected in the process	No resettlements took place in 2020.		16	3, 10
MM10	Number and percentage of operations with closure plan	Facility Stewardship and Transformation		15	7, 10

Safety Performance

Data recordkeeping audits, injury classification reviews and other factors have resulted in changes to our safety data from prior reporting.

A supervised contractor is a contractor for whom Alcoa supervises not only the output, product or result to be accomplished by the person's work, but also the details, means, methods and processes by which the work objective is accomplished.

Fatalities

Employees/all contractors

	Global	Australia	Europe	North America	South America
2017	0/3	0	0/1	0	0/2
2018	0	0	0	0	0
2019	0	0	0	0	0
2020	0/1	0	0	0	0/1
2021	0	0	0	0	0

Days Away, Restricted and Transfer Rate

Employees and all contractors

	Global	U.S. Manufacturing Average	Australia	Europe	North America	South America
2017	0.62	2.0	0.85	0.63	0.82	0.22
2018	0.71	2.0	0.96	0.64	1.03	0.27
2019	0.87	2.0	1.21	0.82	1.26	0.35
2020	0.61	1.8	1.21	0.58	0.65	0.24
2021	0.57	–	1.42	0.46	0.60	0.12

The 2021 Bureau of Labor Statistics U.S. manufacturing industry average was not available at the time this report was published. 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.

Fatalities by Gender

Employees and all contractors

	Male	Female	Total
2017	3	0	3
2018	0	0	0
2019	0	0	0
2020	1	0	1
2021	0	0	0

Days Away, Restricted and Transfer Rate

Employees and supervised contractors

	Global	U.S. Manufacturing Average	Australia	Europe	North America	South America
2017	0.92	2.0	1.07	0.74	1.05	0.32
2018	1.01	2.0	1.16	0.79	1.23	0.18
2019	1.30	2.0	1.37	0.92	1.59	0.64
2020	0.90	1.8	1.44	0.79	0.76	0.17
2021	0.92	–	1.60	0.57	0.71	

The 2021 Bureau of Labor Statistics U.S. manufacturing industry average was not available at the time this report was published. 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.

Fatal and Serious Injuries/Illnesses

Employees and all contractors

	FSI Actuals (Events resulting in a fatal or serious injury/illness)	FSI Potentials (Near-miss events)	Total FSI Events	Total FSI Rate
2017	5	433	438	1.86
2018	3	427	430	1.84
2019	3	339	342	1.38
2020	1	387	388	1.41
2021	3	309	312	1.08

A serious injury/illness is any incident that is life-threatening or life-altering. FSI rate is FSI actuals and potentials per 100 full-time workers.

Days Away, Restricted and Transfer Incidents by Gender

Employees and supervised contractors

	Male	Female	Total
2017	121	10	131
2018	127	17	144
2019	170	12	182
2020	119	12	131
2021	116	12	128

Days Away, Restricted and Transfer Rate

Non-supervised contractors

	Global	Australia	Europe	North America	South America
2017	0.20	0.30	0.34	0.10	0.19
2018	0.34	0.51	0.29	0.35	0.30
2019	0.39	0.81	0.57	0.27	0.29
2020	0.30	0.62	0.12	0.23	0.26
2021	0.24	0.97	0.22	0.28	0.11

Because contractors not directly supervised by Alcoa maintain their own health and safety programs and are accountable for investigating incidents involving their employees, certain details associated with their internal investigations are not fully transparent to Alcoa.

Lost Workday Rate

Employees and supervised contractors

	Global	U.S. Manufacturing Average	Australia	Europe	North America	South America
2017	0.32	0.9	0.59	0.12	0.25	0.19
2018	0.29	0.9	0.49	0.13	0.26	0.12
2019	0.33	0.9	0.63	0.18	0.11	0.47
2020	0.28	0.9	0.67	0.16	0.11	0.06
2021	0.37	-	0.75	0.21	0.18	0.23

The 2021 Bureau of Labor Statistics U.S. manufacturing industry average was not available at the time this report was published. Lost workday rate represents the number of injuries and illnesses resulting in one or more days away from work per 100 full-time workers.

Days Away, Restricted and Transfer Incidents by Gender

Non-supervised contractors

	Male	Female	Total
2017	19	1	20
2018	35	4	39
2019	44	3	47
2020	36	2	38
2021	34	2	36

Lost Workday Incidents by Gender

Employees and supervised contractors

	Male	Female	Total
2017	42	4	46
2018	40	1	41
2019	45	1	46
2020	39	2	41
2021	46	6	52

Lost Workday Rate

Employees and all contractors

	Global	U.S. Manufacturing Average	Australia	Europe	North America	South America
2017	0.25	0.9	0.49	0.12	0.20	0.16
2018	0.22	0.9	0.41	0.09	0.24	0.11
2019	0.25	0.9	0.52	0.26	0.11	0.18
2020	0.22	0.9	0.53	0.11	0.11	0.16
2021	0.25	-	0.67	0.18	0.19	0.07

The 2021 Bureau of Labor Statistics U.S. manufacturing industry average was not available at the time this report was published. 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 Rate

Non-supervised contractors

	Global	U.S. Manufacturing Average	Australia	Europe	North America	South America
2017	0.14	0.24	0.11	0.05	0.15	0.19
2018	0.13	0.26	0.00	0.17	0.10	0.12
2019	0.19	0.27	0.46	0.11	0.12	0.47
2020	0.16	0.17	0.00	0.12	0.18	0.06
2021	0.13	0.49	0.11	0.22	0.05	0.23

Because contractors not directly supervised by Alcoa maintain their own health and safety programs and are accountable for investigating incidents involving their employees, certain details associated with their internal investigations are not fully transparent to Alcoa.

Lost Workday Incidents by Gender

Non-supervised contractors

	Male	Female	Total
2017	13	1	14
2018	13	2	15
2019	18	2	20
2020	20	0	20
2021	19	0	19

Total Recordable Incidents by Gender

Employees and supervised contractors

	Male	Female	Total
2017	292	30	322
2018	293	40	333
2019	339	28	367
2020	273	31	304
2021	242	37	279

Total Recordable Incident Rate

Employees and all contractors

	Global	U.S. Manufacturing Average	Australia	Europe	North America	South America
2017	1.57	3.5	1.96	1.36	2.37	0.45
2018	1.66	3.4	2.38	1.45	2.41	0.55
2019	1.77	3.3	2.27	1.48	3.00	0.54
2020	1.37	2.8	2.27	1.28	1.90	0.42
2021	1.22	–	2.61	1.70	1.53	0.20

The 2021 Bureau of Labor Statistics U.S. manufacturing industry average was not available at the time this report was published. Total recordable incident rate includes days away, restricted and transfer cases plus cases that involve days of medical treatment or other recordables per 100 full-time workers.

Total Recordable Incident Rate

Non-supervised contractors

	Global	Australia	Europe	North America	South America
2017	0.59	1.30	0.79	0.45	0.39
2018	0.83	1.69	0.48	1.04	0.58
2019	0.79	1.72	1.36	0.76	0.50
2020	0.57	1.30	0.48	0.64	0.41
2021	0.49	2.11	1.12	0.28	0.19

Because contractors not directly supervised by Alcoa maintain their own health and safety programs and are accountable for investigating incidents involving their employees, certain details associated with their internal investigations are not fully transparent to Alcoa.

Total Recordable Incident Rate

Employees and supervised contractors

	Global	U.S. Manufacturing Average	Australia	Europe	North America	South America
2017	2.26	3.5	2.23	1.57	3.01	0.64
2018	2.33	3.4	2.69	1.87	2.81	0.43
2019	2.62	3.3	2.50	1.52	3.73	0.70
2020	2.06	2.8	2.65	1.63	2.22	0.45
2021	2.01	–	2.81	1.96	1.93	0.23

The 2021 Bureau of Labor Statistics U.S. manufacturing industry average was not available at the time this report was published. Total recordable incident rate includes days away, restricted and transfer cases plus cases that involve days of medical treatment or other recordables per 100 full-time workers.

Total Recordable Incidents by Gender

Non-supervised contractors

	Male	Female	Total
2017	55	4	59
2018	88	7	95
2019	92	4	96
2020	69	4	73
2021	71	3	74

ERM CVS Limited Assurance Statement

Independent Assurance Statement to Alcoa Corporation

ERM Certification and Verification Services Inc ('ERM CVS') was engaged by Alcoa Corporation ('Alcoa') to provide limited assurance in relation to the information for year ending 31 December 2021 set out below and presented in the 2021 Alcoa Sustainability Report (the 'Report').

Engagement Summary

Assurance Scope	<p>Whether Alcoa's assertions relating to the following ICMM subject matters in the Report are fairly presented, in all material respects, with the reporting criteria:</p> <ul style="list-style-type: none"> • SM1 - The alignment of the Alcoa's sustainability policies, management standards and procedures to the ICMM Principles, any mandatory requirements set out in ICMM Position Statements, the corporate level PEs, and corporate-level aspects of combined PEs • SM2 – Alcoa material sustainability risks and opportunities based on its own review of the business and the views and expectations of its stakeholders. • SM3 - The existence and status of implementation of management systems and approaches that Alcoa is using to manage the identified material sustainability risks and opportunities. • SM4 - reported performance during the given reporting period for a selection of Alcoa's identified material sustainability risks and opportunities as follows: <ul style="list-style-type: none"> • Direct (Scope 1) GHG emissions [million metric tons CO2e] • Indirect (Scope 2 location based) GHG emissions [million metric tons CO2e] • Electricity from renewable sources [%] [smelters only] • GHG Intensity [Metric tons of CO2e per metric ton of production] • Other indirect (Scope 3) GHG emissions • Total Scope 3 GHG Emissions [million metric tons CO2e] – the sum of the following categories: 1, 3, 4, 5, 6, 9, 10, and 15; as well as the individual total for each of the following categories: <ul style="list-style-type: none"> ◦ Scope 3 GHG emissions: Cat 1 [million metric tons CO2e] ◦ Scope 3 GHG emissions: Cat 3 [million metric tons CO2e] ◦ Scope 3 GHG emissions: Cat 4 [million metric tons CO2e] ◦ Scope 3 GHG emissions: Cat 10 [million metric tons CO2e] • Perfluorocarbon Emissions (million metric tons CO2e) [Smelters only] • Energy consumption – Direct [thousands of gigajoules] • Energy consumption – Purchased Electricity [thousands of megawatt hours] • Operational Water Withdrawal (Inputs) (WAF Categories 1 and 2) – all sites [million cubic meters] • Operational Water Withdrawal (Inputs) (WAF Categories 1 and 2) – Locations in Alcoa-defined Water-scarce Areas [million cubic meters] • Operational Water Consumption (Outputs) (WAF Categories 1 and 2) – all sites [million cubic meters] • Operational Water Consumption (Outputs) (WAF Categories 1 and 2) – Locations in Alcoa-defined Water-scarce Areas [million cubic meters] • Total water use – Locations in Alcoa-defined Water-scarce Areas [percent] • Waste to landfill [000s of metric tons] • Bauxite residue generated [000s of metric tons] • Active mining disturbance to mine rehabilitation ratio [number] • Fatality incidents [number] • FSI-Actual incidents (FSI-A) [number] • Days Away, Restricted or Transfer (DART) incidents [number] • Lost Work Day incidents (LWD) [number] • SM5 - disclosures regarding Alcoa's prioritisation process for selecting assets for third-party PE Validation
Reporting Criteria	ICMM Mining Principles Alcoa's Basis of Reporting (as detailed in appropriate sections of the Report)
Level of Assurance	Limited Assurance.
Assurance Standard	ERM CVS' assurance methodology which is in accordance with the International Standard on Assurance Engagements ISAE 3000 (Revised) 'Assurance Engagements other than Audits and Reviews of Historical Financial Information'. ISO 14064:3 'Specification with guidance for the verification and validation of greenhouse gas statements'

Respective Responsibilities

The Board of Alcoa is responsible for preparing the Report and for the collection and presentation of the disclosures covered by the scope of our engagement. Also for designing, implementing and maintaining effective internal controls over the information and data.

ERM CVS' responsibility is to provide an opinion, based on the assurance activities undertaken and exercising our professional judgement, on whether the information covered by the scope of our engagement has been prepared in accordance with the stated criteria. ERM CVS disclaims any liability for any decision a person or entity may make based on this Assurance Statement.

Our conclusion

Based on our activities, as described below, nothing has come to our attention to indicate that Alcoa's assertions relating to the ICMM subject matters (SM) in the Report, included in 'Assurance Scope' above, are not fairly presented, in all material respects, with the reporting criteria

Our assurance activities

We planned and performed our work to obtain sufficient and appropriate evidence to support our opinion, and to reduce the risk of a material error or omission in the assured information. Our assurance procedures included, but were not restricted to, the following activities:

- A review of external media reports to identify relevant sustainability issues for Alcoa in the reporting period;
- Web-based interviews with Alcoa personnel responsible for data reporting, management systems, materiality, risk, stakeholder engagement, ICMM Mining Principles, mandatory requirements set out in ICMM Position Statements, the corporate level PEs, and corporate-level aspects of combined PEs;
- A review of the suitability of the reporting criteria and related internal reporting processes, including conversion factors, estimates and assumptions used;
- An analytical review and substantive testing (on a sample basis) of the key performance indicators included in the 'Assurance Scope' submitted by all sites, and follow up and close out of our queries;
- Web-based visits to Alcoa operations in Australia (Portland), Norway (Lista) and United State (Warrick) to verify the source data underlying the key performance indicators included in the 'Assurance Scope' and to review local environmental, safety and community engagement management approaches;
- Substantive procedures relating to the disclosure of the information in the 'Assurance Scope' including review of further evidence relating to performance, management approaches and reporting systems including the effectiveness of internal controls in relation to the accuracy and completeness of the information; and
- A review of the presentation of information relevant to the scope of our work in the Report to ensure consistency with our findings.

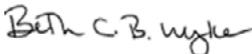
The limitations of our engagement

We do not express any opinion on any other information in the Report or on Alcoa's website for the current reporting period, or on the baseline values used for presenting performance against targets. We do not provide any assurance on prospective information including ambitions, plans, expectations or their achievability.

The reliability of the assured information is subject to inherent uncertainties, given the available methods for determining, calculating or estimating the underlying information so it is important to understand our assurance opinion in this context.

Ethics, independence, competence and quality control

ERM CVS is a member of the ERM Group and all employees are subject to ERM's Global Code of business conduct and ethics. ERM CVS is accredited by the United Kingdom Accreditation Service (UKAS) and our operating system is designed to comply with ISO 17021:2011. We have policies and procedures in place covering quality, independence and competency. In line with established best practice for non-financial assurance, this engagement was undertaken by a team of assurance, EHS and sustainability professionals. The work that ERM CVS conducts for clients is solely related to independent assurance activities and auditor training. Our established management processes are designed and implemented to ensure the work we undertake with clients is free from organisational and personal conflicts of interest or bias. ERM CVS and the staff that have undertaken this assurance engagement provide no consultancy related services to Alcoa Corporation in any respect.



Beth Wyke
Partner, Corporate Assurance
Malvern, PA

April 29, 2022

ERM Certification and Verification Services, Inc.

www.ermcvs.com | post@ermcvs.com





ALCOA CORPORATION

201 Isabella Street
Suite 500
Pittsburgh, PA 15212-5858
Tel 1.412.315.2900
www.alcoa.com

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