



## 2022 Sustainability Report

# Moving Forward Sustainably





# About this Report

This Sustainability Report provides a comprehensive overview of our approach to managing our environmental, social and governance (ESG) topics, and highlights progress on Alcoa's sustainability goals.

The information in this report covers Alcoa's performance for the 2022 calendar year for operations owned and managed by Alcoa. We prepared this report in accordance with the Global Reporting Initiative (GRI) Universal Standards, Sustainability Accounting Standards Board (SASB) Metals & Mining Standard and International Council on Mining & Metals (ICMM) Principles.

This report also reflects our contributions toward the United Nations Sustainable Development Goals (UN SDGs). A summary of our alignment with reporting standards can be found in the **Appendices**. ERM Certification and Verification Services Inc. (ERM CVS) has provided limited assurance on selected information and key performance indicators.

## Forward-Looking Statements

This Sustainability Report includes forward-looking statements regarding our sustainability goals, commitments and strategies. Our actual results could differ materially from our projected results due to a variety of factors, including assumptions not being realized, scientific or technological developments, geopolitical events, fluctuations in cost and availability of raw materials, evolving sustainability strategies, regulatory changes or other risks and uncertainties.

All statements other than statements of historical or current facts, including statements regarding our plans, initiatives, projections, goals, commitments, expectations, or prospects, are forward-looking. Words such as "aim," "ambition," "anticipate," "believe," "drive," "could," "develop," "drive," "effort," "endeavor," "estimate," "expect," "forecast," "goal," "guidance," "intend," "may," "outlook," "plan," "potential," "predict," "projection," "projects," "seek," "see," "should," "target," "will," "working," and other similar words that can be used to describe future events and trends.

Forward-looking statements speak only as of the date they are made. We undertake no obligation to update publicly or otherwise revise any forward-looking statements, whether because of new information, future events or other factors that affect the subject of these statements, except where we are expressly required to do so by law.

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, 2022, filed with the Securities and Exchange Commission on February 23, 2023.



## This Report has Interactive Elements

### Table of Contents

Starting in the Overview section, our report features a navigational sidebar that doubles as a table of contents. Click on a title to jump to that section and see the related subsections.

The previous and next arrow buttons navigate forward and backward through the document.

### Related Report Content

Internal links are found throughout the report. These links provide access to related content within the document, such as a list of acronyms in **Appendix E**.

### Read More


This sustainability report focuses on our 2022 performance. More information regarding our policies, processes and other key information can be found on our website, as well as additional sources or references on external websites. This related information can be accessed by clicking the Read More links found throughout the report.


[Read more: Alcoa Sustainability](#)

# 2022 Highlights


## ENVIRONMENT


 **2.5%**  
decrease in  
landfilled waste

 **4.6%**  
decrease in  
CO<sub>2</sub>e emissions

 **86%**  
of electricity powering  
our smelters came from  
renewable sources<sup>1</sup>

 **0.8%**  
reduction in  
bauxite residue  
land requirements<sup>3</sup>

 **0.82:1**  
active mining disturbance  
to mine rehabilitation<sup>2</sup>

 **31.5%**  
of spent pot lining  
generated was diverted  
for recovery, a 191.6%  
increase from 2021

<sup>1</sup> Renewable energy is derived from natural processes that are replenished constantly, such as sunlight, wind, and hydropower.

<sup>2</sup> From 2018 – 2022.


<sup>3</sup> Per metric ton of alumina produced.

## SOCIAL

 **Zero**  
worker fatalities

 **18.4%**  
female workforce

 **36.6%**  
increase in new hires from  
underrepresented groups

 **17%**  
decrease in our  
FSI-P rate<sup>2</sup>

 **90 scored**  
on the Human Rights  
Campaign Foundation's  
Corporate Equality Index<sup>1</sup>

 **\$7M**  
invested in communities  
through Alcoa Foundation  
grants and corporate  
giving programs (US\$)

<sup>1</sup> Out of 100 possible points.

<sup>2</sup> 0.88 fatal and serious injury potential incidents per 100 full-time workers.

## GOVERNANCE

 **Zero**  
violations of human rights

 **17**  
locations certified to ASI's  
Performance Standard

 **Top 1%**  
of companies within the  
manufacture of basic precious  
and other non-ferrous metals  
industry according to EcoVadis



# Letter to Our Stakeholders

With its durability, light weight and strong recyclability, aluminum has been central to societal innovation. It has revolutionized how we move, build and fly. It continues to positively influence numerous sectors including construction, packaging, transportation, aerospace, and electronics and will continue to impact innovation in the future.

But not all aluminum is created equal. Responsible and sustainable practices are vital for our Company, our customers and the world. In fact, strong environmental, social and governance performance will be key differentiators in the industry for the future. That is why Alcoa has a strategic priority to advance sustainably and a vision to reinvent the aluminum industry.

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

**ROY C. HARVEY**  
President and CEO  
Alcoa

## **Accelerating the Transition to a World with Limited Carbon Emissions**

Alcoa has an ambition to reach net-zero emissions (Scope 1 and Scope 2) by 2050, with interim targets to achieve a 30 percent reduction by 2025 and a 50 percent reduction by 2030, using our 2015 baseline. We are working to develop technology projects that have the potential to help us reach our decarbonization ambitions.

Our **ELYSIS™** inert-anode technology uses a proprietary process, first developed by Alcoa, that eliminates all direct greenhouse gas (GHG) emissions from the traditional smelting process, emitting clean oxygen as byproduct.

Our **Refinery of the Future™** initiative aims to achieve zero-carbon alumina refining through a host of new processes and technologies.

Our **ASTRAEA™** scrap purification technology under development has the potential to process non-ferrous scrap to purity levels that far exceed most commercial smelters. If successful, it would offer the opportunity to use more post-consumer scrap for an even wider range of purposes.



## Aligning with the Science on Climate Change

We have embarked on a global study to understand the long-term impacts of climate change on operating assets, using a broad range of science-based scenarios from the United Nations Intergovernmental Panel on Climate Change (IPCC).

We know indirect emissions are an important part of the climate change equation, so we are considering potential approaches with respect to Scope 3 GHG emissions. This includes working collaboratively with our customers and business partners.

In 2022, our carbon-reduction efforts included continued work on increasing the percentage of renewable energy powering our aluminum production. At the end of the year, 86 percent of our global smelting portfolio was powered by renewable energy such as hydropower, wind or sunlight.

Our environmental priorities also include efforts to restore ecosystems that may be impacted by our operations. We strive to progressively rehabilitate mining sites and return decommissioned sites to productive reuse. We also prioritize locations with impoundments to work toward compliance with the Global Industry Standard on Tailings Management (GISTM).

## Protecting the Safety and Health of our Workforce

While environmental progress is important, the safety and health of our employees continues to be our overarching focus.

In 2022, we extensively reviewed our corporate safety and health systems to improve critical risk management. We have made progress in lowering our incident rates, including a 17 percent decrease in our fatality and severe injury/illness potential (FSI-P) rate decreased compared to 2021.

Our definitions of safety and health are also expanding to recognize and address social and psychological factors that would pose risks to the well-being of our workforce. We are deploying new technologies, such as microsleap detection and fatigue data analytics, at several high-risk operating sites.

## Promoting a Strong Culture of Diversity, Equity and Inclusion

People are at the heart of everything we do. Recognizing that there is strength in diversity, we aim to build inclusive and diverse work teams. As a result of these efforts, we were named in the 2022 Bloomberg Gender-Equality Index, and we received a score of 90 on the Human Rights Campaign Foundation's Corporate Equality Index.

We continue to champion employee-led initiatives. For example, the Alcoa Women's Network (AWN) celebrated its 20<sup>th</sup> anniversary with a virtual panel on International Women's Day that was attended by hundreds of Alcoans around the world.

Our 2022 independent gender pay equity analysis confirmed that we have achieved equal pay at each job level. And, despite a contracting global job market, we have increased our overall share of female employees.

## Investing in our Communities

In 2022, Alcoa and the Alcoa Foundation, the nonprofit organization associated to Alcoa, partnered with numerous non-profit organizations in our communities. A total of US\$7 million was spent to support these efforts.

2022 also marked the 70th anniversary of the Alcoa Foundation. Its efforts remain focused on two program areas, education and environmental stewardship. Most recently, it began supporting adaptation efforts at the grassroots level to slow the effects and impacts of a changing climate.

In Brazil, Instituto Alcoa seeks to promote positive transformation in our areas of influence. The non-profit institution that is affiliated with Alcoa invested more than US\$1.3 million in the host communities of our three major operations in Brazil—Alumar, Poços de Caldas and Juruti.

In Canada, the Alcoa Sustainable Communities Fund, supported with Alcoa funding, provided C\$1 million to community-led projects in the Baie-Comeau, Bécancour and Deschambault-Grondines/Portneuf regions of Québec. Since its creation in 2011, the fund has supported nearly 147 projects and invested approximately C\$11 million.

In Australia, the Alcoa Harvey Waroona Sustainability Fund continues to serve the communities of Harvey and Waroona in Western Australia. Since its inception in 2008, the fund receives disbursements based on revenues from our Wagerup refinery and its monies are used to back community development projects in the area.

## Turning Raw Potential into Real Progress

We invented the aluminum industry more than 135 years ago. That legacy motivates us for a better future, one where aluminum will play an even larger role in solving decarbonization challenges in a world threatened by climate change.

With the distinct advantage of being active in all aspects of upstream aluminum production, we are working with industry partners, governments, associations, and communities in alignment with our purpose: to turn raw potential into real progress.

We are proud to share more details of that progress in our 2022 Sustainability Report. We will continue to deliver on our purpose as we move toward a more sustainable future.

Sincerely,



**ROY C. HARVEY**

Alcoa President and Chief Executive Officer





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# Turning Raw Potential into Real Progress

We are committed to building a more sustainable future by making products that are essential for a greener economy, setting ambitious sustainability targets and addressing material issues in our operations.





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# Corporate Overview

Alcoa is a global leader in bauxite mining, alumina refining and aluminum smelting and casting. With operations on six continents, Alcoa has a workforce of more than 13,000 employees.

Our legacy dates back to 1886, with the discovery of a commercial process that allowed aluminum to be produced economically. This discovery paved the way for industrial progress and transformed aluminum into a material that influences our daily lives.

Our Company is organized in two business segments: Alumina and Aluminum. The alumina segment includes our global bauxite mines and our alumina refining assets. We are one of the world's largest bauxite miners, with active mines in Brazil and Australia. We also operate the world's largest third-party alumina business, with six refineries on three continents. Our Aluminum segment includes aluminum smelting, casting and the majority of our energy assets.

More information about our Company's recent operation and financial performance can be found in our Annual Report.

[▶ Read more: Alcoa 2022 Annual Report](#)





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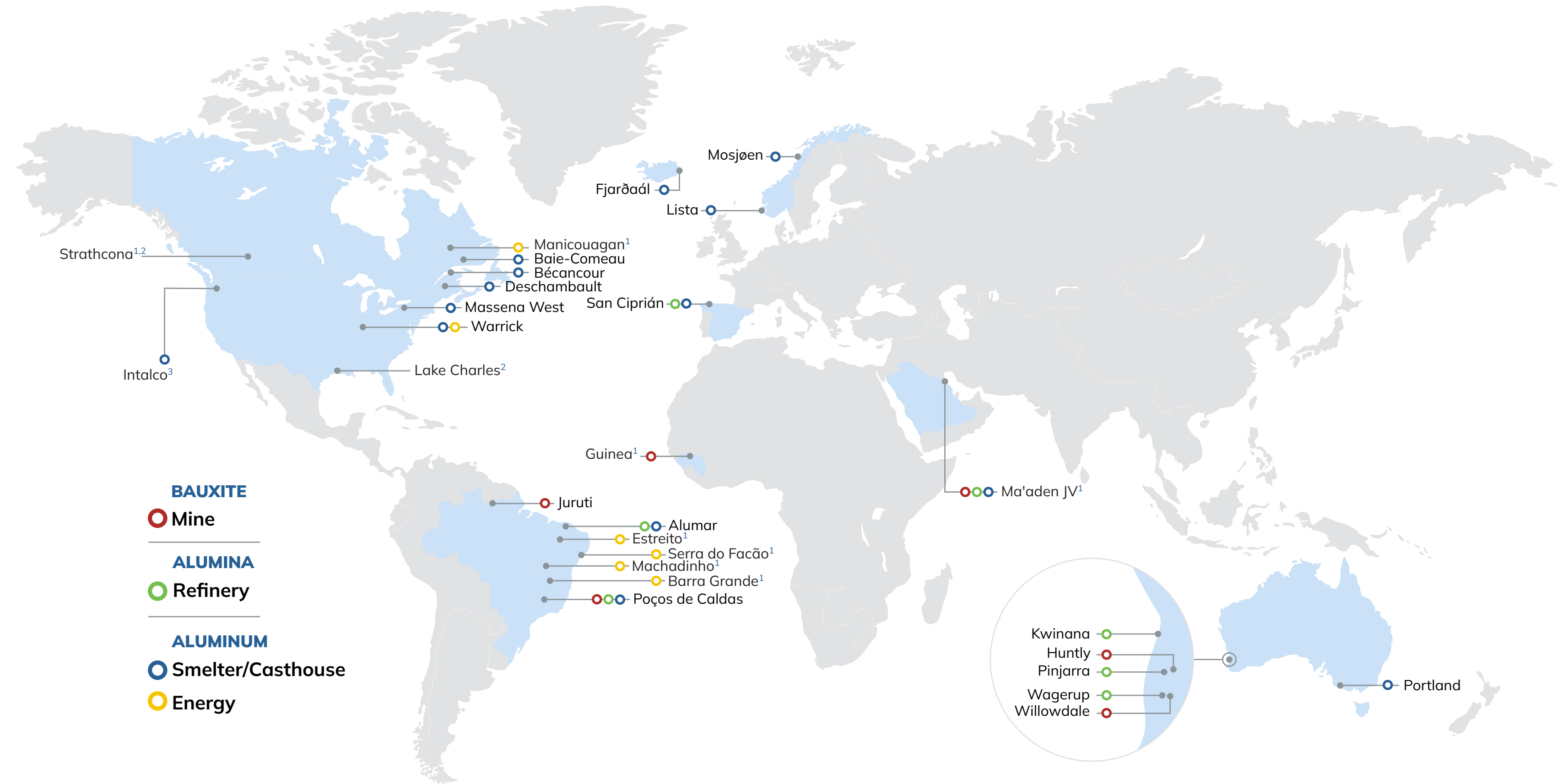
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## Alcoa Locations



Location data as of February 1, 2023.

<sup>1</sup> Minority ownership, non-operating partner.

<sup>2</sup> Processes petroleum coke, a raw material used to create anodes used in aluminum smelting.

<sup>3</sup> Aluminum smelting and casting capacity is fully curtailed.





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# Products

Aluminum is a critical material for a more sustainable future. Due to its lightweight, durability, and recyclability, it is vital for many of the products that enrich our daily lives, including vehicles, packaging, electronic devices, buildings, and energy infrastructure.

Traditional aluminum production, however, is an energy-intensive process that generates significant GHG emissions. We recognize that the aluminum industry must work to reduce these emissions. Alcoa has invested significant time, effort and resources into creating processes and products to meet the needs and challenges of our customers today while incrementally reducing our carbon footprint for tomorrow.

We offer a comprehensive product portfolio made with lower carbon emissions with our Sustana™ line, which includes EcoSource™ alumina, EcoLum™ primary aluminum, and EcoDura™ aluminum with at least 50 percent recycled content.

More information about EcoDura™ and our recycling efforts can be found in our [Circular Economy and Waste Management](#) section.





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These products provide customers an opportunity to lower their carbon footprint by using Alcoa products with lower carbon emissions than industry averages.

To further support our customers with current carbon footprint information, we updated the life cycle assessments for our EcoSource™ and EcoLum™ products in 2022. This information is available to our customers upon request.

In addition, we are working to eliminate all direct GHG emissions from the traditional aluminum smelting process through our ELYSIS™ partnership. This emerging technology emits pure oxygen rather than greenhouse gases. It is also estimated to increase production by 15 percent and reduce operating costs by 15 percent.

[Read more: ELYSIS™](#)

Another cost-competitive decarbonization initiative being developed at Alcoa is our Refinery of the Future™ program. This program aims to reduce the emissions that are generated from the thermal energy used in the refining process, which are the third-largest contributor to carbon footprint of aluminum after power- and smelting-related emissions<sup>1</sup>.

[Read more: Refinery of the Future™](#)

See the [Climate Change](#) section for additional information on both initiatives.

<sup>1</sup> Source: IAI

<sup>2</sup> Pre-consumer scrap recycled content estimated using mass-balance approach at facility level.

**Sustana™ Family of Products**

**EcoSource™**

Low-carbon alumina

**EcoLum™**

Low-carbon primary aluminum

**EcoDura™**

Aluminum, which has a minimum 50 percent recycled content<sup>2</sup>

[Read more: Sustana™ Line](#)

Alcoa is also certified to standards from the Aluminium Stewardship Initiative (ASI). This is the aluminum industry's most comprehensive third-party system to verify responsible production methods. It covers a wide range of indicators along the entire value chain in governance, environmental management and social responsibility.



## Bauxite

Our commitment to mining responsibly and reliably has allowed us to become one of the world's largest bauxite producers.

See the [Biodiversity and Mine Rehabilitation](#) section for more information.





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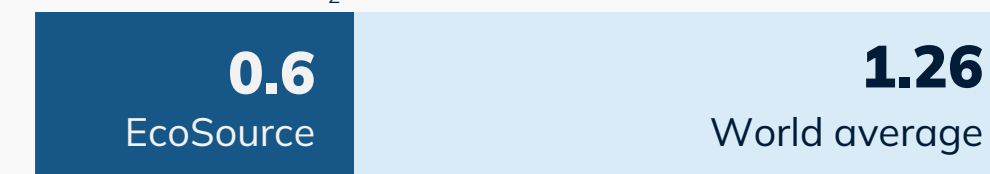


## Alumina

As the world's largest third-party supplier of alumina, we recognize the potential environmental impacts, particularly the GHG emissions produced in the refining process. We have taken steps to address this directly and, as a result, our refineries have a GHG intensity that is 50 percent lower than the alumina industry's global average.

### EcoSource™ Emissions Intensity vs. Global Average

Metric tons of CO<sub>2</sub>e/ton of alumina<sup>1</sup>



### Region of Production – Refining



## SMELTER-GRADE ALUMINA

In 2022, we witnessed continued interest in our low carbon alumina brand, EcoSource™. This smelter-grade alumina comes from a refinery portfolio with an average emission intensity of no more than 0.6 metric tons of CO<sub>2</sub>e per metric ton produced, including Scope 1 and 2 emissions from bauxite mining and alumina refining processes. This is 50 percent less than the industry average of 1.26 metric tons of CO<sub>2</sub>e<sup>1</sup> due to a combination of fuel type, fuel efficiency and continuous decarbonization efforts led by our Refining Center of Excellence (CoE).

Our EcoSource™ products have third-party carbon footprint certificates that validate their cradle-to-gate carbon emissions. Our customers can use this information during life cycle assessments to demonstrate a smaller carbon footprint compared to industry averages.

## NON-METALLURGICAL ALUMINA

We are the world's largest producer, outside of China, of non-metallurgical alumina (NMA). While lesser known than smelter grade alumina, NMA is used for purposes that range from applications such as water purification (hydrate) to a calcined material that is used for refractories, abrasives and ceramics.

Like our EcoSource™ products, our NMA products also have third-party carbon footprint certificates.

<sup>1</sup> Source: CRU emission intensity data, 2022





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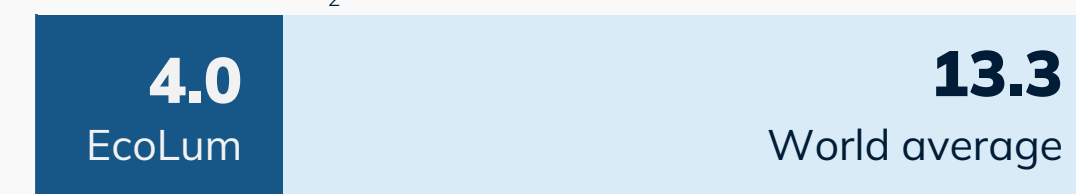
## Aluminum

The traditional process for smelting alumina to produce molten aluminum is energy-intensive and generates GHG emissions. Our commitment to sustainability has led us to focus on reducing our total energy consumption and GHG emissions by increasing our use of renewable energy to power our smelters. (See the [Climate Change](#) section.)

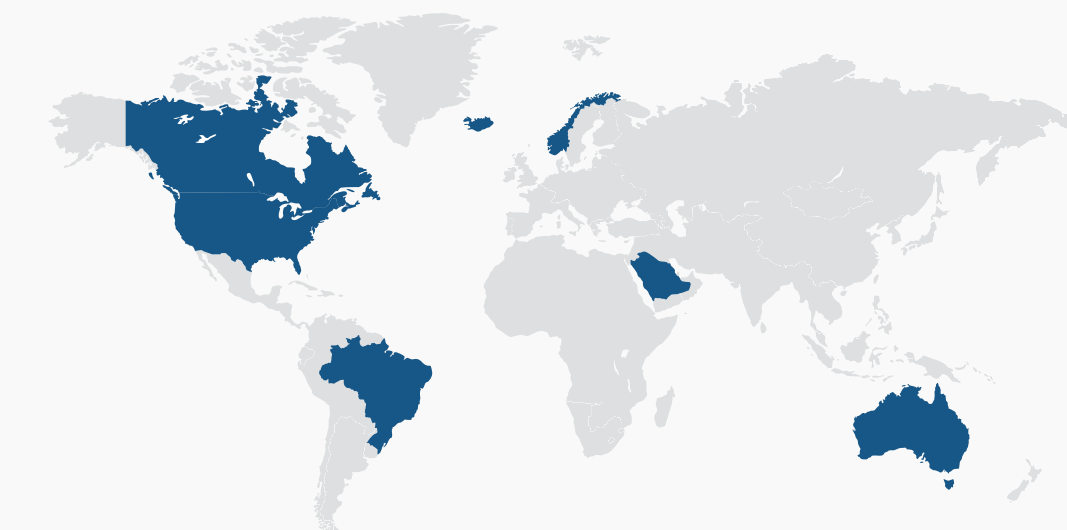
Our global casthouse network produces a complete portfolio of primary aluminum products, including billet, foundry ingot, rolling slab, wire rod, powder, and high-purity and P1020 ingots. These shapes are offered under our EcoLum™ brand of products with an emissions intensity of less than 4.0 metric tons of CO<sub>2</sub>e for every metric ton of metal produced, including Scope 1 and 2 emissions from bauxite mining, alumina refining, aluminum smelting and casting processes. This is approximately three times lower than the industry average<sup>1</sup>.

### EcoLum™ Emissions Intensity vs. Global Average

Metric tons of CO<sub>2</sub>e/ton of aluminum<sup>1</sup>



### Region of Production (Smelting)



In 2022, we announced two projects to expand smelter capacity at our Mosjøen smelter in Norway and broaden the product portfolio at our Deschambault smelter in Canada. Both smelters are predominantly hydro-powered, low carbon intensity, and capable of offering EcoLum™ products.

We offer a third-party verified life cycle assessment in the form of an Environmental Product Declaration (EPD) for our EcoLum™ products. Customers can use these EPDs, which are available upon request, for life cycle assessments of their products.

[Read more: Mosjøen Smelter Expansion and Deschambault Casting Increase](#)

<sup>1</sup> Source: CRU emission intensity data, 2022

### Customer Testimony

## Reducing Speira's Footprint

In 2022, Alcoa entered into an agreement to provide EcoLum™ aluminum to Speira, a world-leading producer of advanced rolled aluminum products. Speira's manufacturing divisions serve customers across the automotive, packaging, printing, engineering, building and construction sectors, with seven manufacturing facilities in Germany and Norway.

**“At Speira, we share the passion of reducing the carbon footprint of our products and driving the decarbonization of our business. Our partnership with Alcoa and our decision to purchase EcoLum™ is a natural and important step on this path.”**

**REINHILD SCHMIDT**

Senior Vice President of Strategic Operations  
Speira





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This rear floor frame megacasting for electric vehicle manufacturer NIO used our C611 EZCast™ alloy.

## Alcoa Advanced Alloys

Our family of Advanced Alloys offer superior alternatives to traditional casting alloys. These advanced alloys include those successfully used for the production of megacastings, which are single-piece components that replace dozens of separate stand-alone parts.

They unlock significant process and cost benefits, especially when made with advanced alloys, like Alcoa’s C611 EZCast™ or EZCast-NHT™, which reduce or eliminate the need for dedicated heat-treatment of the cast parts.

[Read more: Alcoa Advanced Alloys](#)

Megacastings are especially crucial for the transition to electric vehicles, which require technology improvements to offset the carbon footprint and the extra weight of electric batteries.

Our C611 EZCast™ alloy earned top recognition for excellence in structural die casting at the 2022 International Die Casting Competition due to its application in megacastings. The alloy reduces GHG emissions in production by not requiring dedicated heat treatment, which also lowers manufacturing costs and increases efficiency during the casting process.

In 2022, we also introduced our A210 ExtrusStrong™ alloy for extrusion applications.

[Read more: C611 EZCast™, Alloy Development and A210 ExtrusStrong™](#)

**“Alcoa’s C611 alloy is the first great step in NIO’s future casting development. We reduced energy consumption and carbon emission by using C611.”**

**GARY HUGHES**

Director of New Product Introduction, Engineering  
NIO

### Additional Advanced Alloys

**High-pressure die-casting EZCast-NHT™ alloy**  
Delivers targeted mechanical properties without heat treatment in an “as cast” state

[Read more: EZCast-NHT™](#)

**VersaCast™ and EverCast™ alloys**  
Comparable mechanical properties to forged alloys

[Read more: VersaCast™ and EverCast™](#)

**SupraCast™ alloy**  
For high-temperature environments

[Read more: SupraCast™](#)

**AT237 High Thermal Conductivity alloy**  
Recently added for e-mobility components and mobile networks

[Read more: AT237 High Thermal Conductivity](#)





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# Sustainability Approach

Sustainability is embedded in our Company's strategy and our vision to reinvent the aluminum industry for a sustainable future. We have three strategic components in our approach:



## Our Communities

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



## Our Operations

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



## Our Products

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





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## Centers of Excellence

In 2022, we developed three new CoEs focusing on strategic topics: social performance, climate change, and biodiversity.

The CoEs support our operations in specialty areas and build capacity at our locations to help achieve relevant targets. In addition, each CoE is responsible for developing policies and standards, setting strategic goals and defining and tracking key performance indicators.



### Creating Sustainable Value

Across our global operations, we strive to partner with our local communities in their efforts to develop and succeed. Being a good neighbor enhances our reputation and supports our social license to operate. Our operations help stimulate economic growth, and we work hard to embed practices in our communities that are sustainable, even if our industrial activities end.

In 2022, we continued to embed our new social management system, SP360. It provides a methodological, people-centric approach to managing social risks, protecting human rights, and minimizing any negative impacts from operations. The process, which is deployed at locations globally, also promotes continuous learning and improvement in an effort to build stronger relationships with local stakeholders and identify growth opportunities. (See the [Stakeholder Engagement](#) section.)

In addition, we have two foundations that help create lasting value in our host communities. The Alcoa Foundation focuses on most countries and locations where we operate, while Instituto Alcoa works with our Brazilian stakeholders.

▶ [Read more: Alcoa Foundation and Instituto Alcoa \(Portuguese only\)](#)

### Enhancing Product Value

We offer a range of low-carbon products via our Sustana™ brand, which is the most extensive in the aluminum industry. This brand family includes products with lower carbon footprints than global industry averages, assisting our customers achieve their own sustainability goals. (See the [Products](#) section.)

We also have earned certifications from ASI that allows us to globally market and sell bauxite, alumina and aluminum with third-party verification of sustainability practices. At the end of 2022, we had 17 operating locations certified to ASI's Performance Standard.

### Reducing Our Footprint

We recognize that primary aluminum production is energy-intensive and has the potential to cause environmental impacts. To that end, we are working to develop and adapt technological advancements that can help reduce our environmental footprint.

We have an ambition to reach net-zero emissions by 2050, and we have mid-term targets for 2025 and 2030 for [GHG emissions](#), [waste](#), [water](#), [mine rehabilitation](#), [inclusion, diversity and equity](#), [safety and health](#), and [social performance](#). Our approach and performance for each can be found in the individual sections within this report.

We continually seek to minimize our environmental impacts. We use biodiversity management plans, which include mine rehabilitation processes, and each of our facilities have an asset management plan that covers the facility's life cycle. (See the [Biodiversity and Mine Rehabilitation](#) and the [Facility Stewardship and Transformation](#) sections.)





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# Strategic Long-Term Goals

Our long-term sustainability goals address material topics for our Company and stakeholders. These goals apply to governance, environmental and social aspects of our operations.

2022 was another successful year for implementing our plans, including completing the rollout of our social performance management system, SP360, across all sites. In addition, we made meaningful reductions in our water consumption and landfilled waste and took steps towards the achievement of our climate goals.

Our sustainability goals are periodically reviewed and updated, and we routinely test key environmental and social outcomes through our materiality analysis. They guide decision making, so we can make good use of natural resources, identify new opportunities, and continually minimize environmental and social impacts.

## Introducing Our New Goal

Alcoa has committed to a new strategic long-term goal related to social performance.

**By 2030, Alcoa Corporation through its operations and in collaboration with Alcoa Foundation and Instituto Alcoa, will increase access to skills development in our host communities, to better equip individuals to participate in economic activities.**

Activities associated with this social performance goal are in course, and associated progress will be disclosed in accordance with ICMM's Socio Economic Reporting: Framework & Guidance indicators from 2024 (2023 base year).





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## Strategic Long-Term Goals

SDG	Goal	Progress
  	<p>Align our GHG emissions intensity target (Scope 1 and 2 associated with our refining and smelting operations) with the 2°C decarbonization pathway by reducing intensity by 30 percent by 2025 and 50 percent by 2030 from a 2015 baseline.</p> <p>Ambition to achieve net-zero GHG emissions by 2050.</p>	<p><b>Climate Change</b></p> <p>25.1 percent reduction from 2015.</p>
   	<p>From a 2015 baseline of 3.79 m<sup>3</sup> water/mt Al, reduce the intensity of our total water use from water-scarce locations by five percent by 2025 and 10 percent by 2030.</p>	<p><b>Water</b></p> <p>5.3 percent decrease from 2015.</p>
 	<p>From a 2015 baseline of 131.7mt, reduce landfilled waste by 15 percent by 2025 and 25 percent by 2030.</p>	<p><b>Waste</b></p> <p>37.6 percent reduction from 2015.</p>
 	<p>From a 2015 baseline of 53 m<sup>2</sup>/1000t m<sup>2</sup>/ k mt Al, reduce bauxite residue land requirements per metric ton of alumina produced by 15 percent by 2030.</p>	<p><b>Impoundment Management</b></p> <p>15.6 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><b>Mine Rehabilitation</b></p> <p>0.82 ratio for the 2018 to 2022 period.</p>
 	<p>Zero fatalities and serious injuries (life-threatening or life-altering injuries and illnesses).</p>	<p><b>Safety and Health</b></p> <p>Zero fatalities and one serious injury in 2022.</p>
 	<p>Achieve a more inclusive culture that reflects the diversity of the communities where we operate.</p>	<p><b>People</b></p> <p>Increased the percent of women in our global employee population from 17.17 to 18.48 percent.</p> <p>The percent of new hires from underrepresented populations was 51.26 percent.</p>
      	<p>By the end of 2022, implement a social performance management system (SP360) at all locations, including the definition of performance metrics and long-term goals to be achieved by 2025 and 2030.</p>	<p><b>Shared Value Creation</b></p> <p>Completed the implementation of SP360 in our mining operations in Australia and Brazil, defined performance metrics and identified a long-term goal.</p>

Each SDG icon indicated here signifies Alcoa's alignment with one of the United Nations Sustainable Development Goals. They are a set of 17 goals with specific indicators agreed to by UN member states for achieving sustainable development, and they demonstrate how our actions contribute to broader global sustainability efforts.





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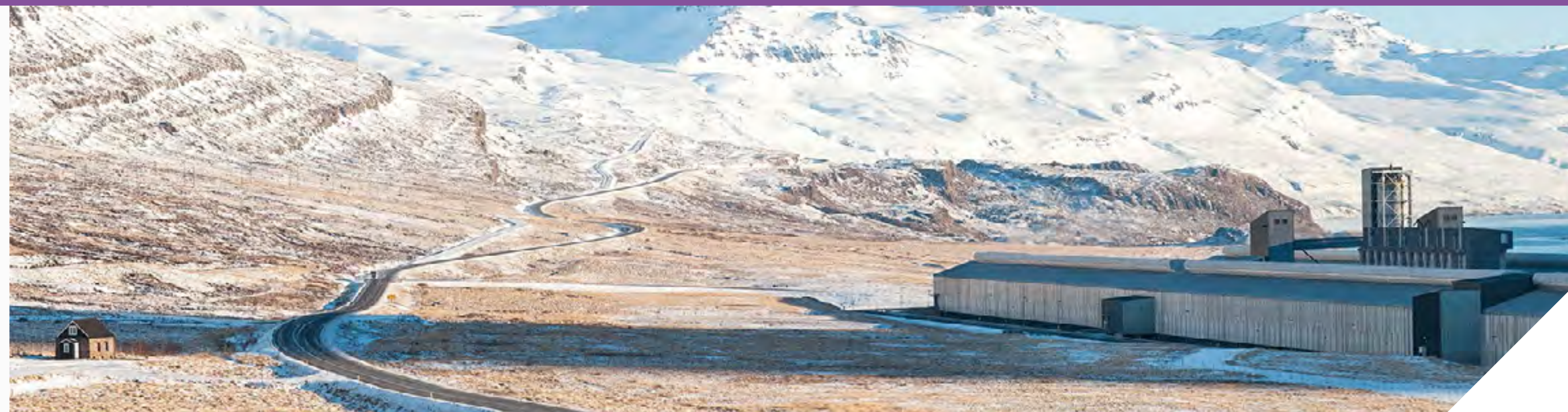
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# Reporting and Materiality

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

We have created this report based on the outcomes of a materiality analysis of relevant sustainability indicators, stakeholder feedback and key disclosure standards. In 2022, we refreshed our sustainability materiality assessment to identify shifting industry priorities, verify focus areas, uncover new opportunities, and prioritize sustainability-related topics that are most important to Alcoa and our stakeholders.

**The 2022 sustainability materiality assessment comprised the following key components:**

- ✓ Benchmarking and performing a trend analysis to identify new or changed topics for assessment
- ✓ Reviewing Alcoa documentation to reflect internal and external stakeholder inputs on relevance, impacts and the importance of different topics
- ✓ Conducting internal workshops with subject matter experts to gather input on topics regarding their importance to Alcoa and their perceived importance to external stakeholders
- ✓ Prioritizing the sustainability material issues using the matrix on the following page





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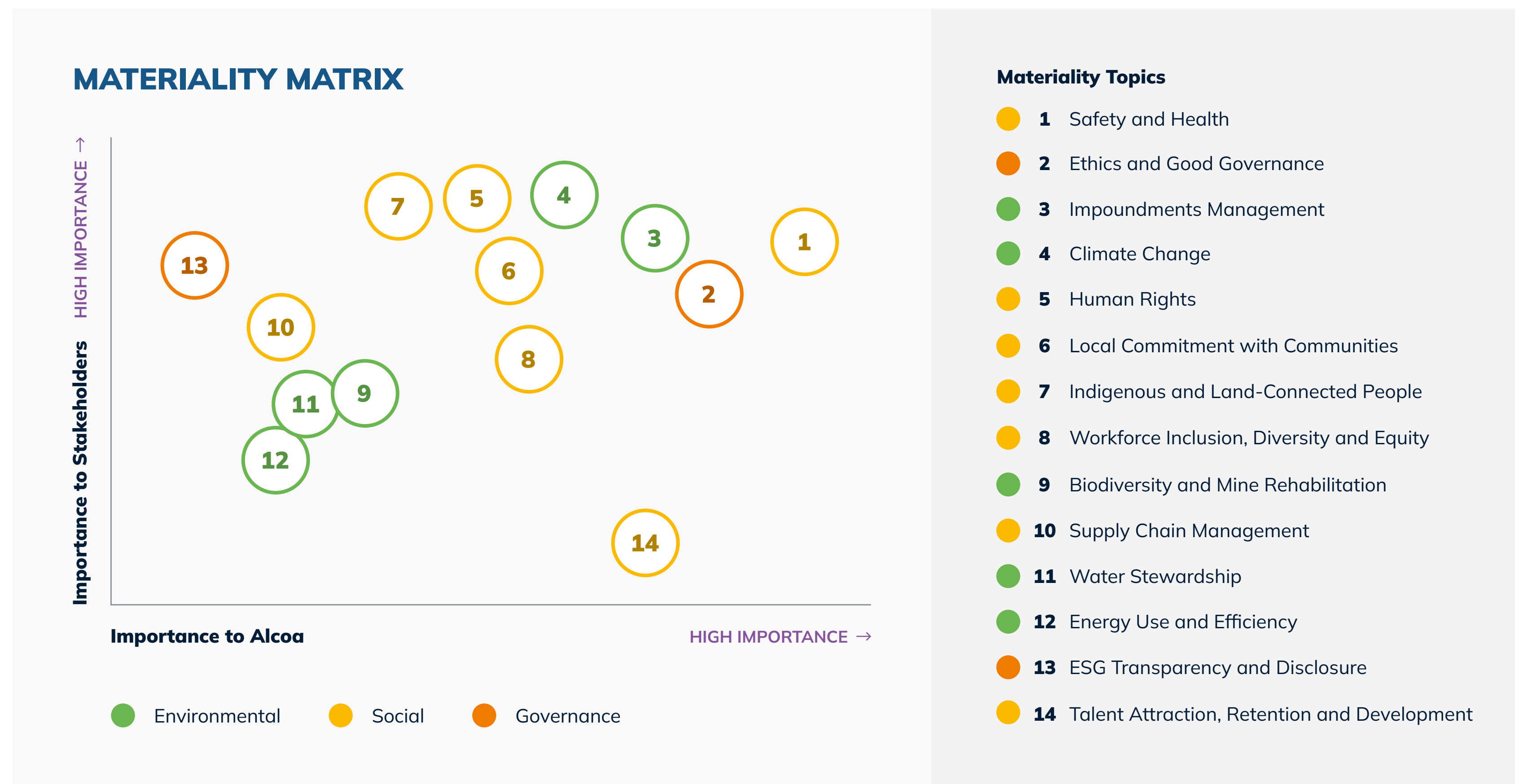
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## Materiality Assessment

As a result of the materiality refresher, we have incorporated changes to our material issues and reevaluated their levels of significance. We define material issues as matters of high importance to either Alcoa or its stakeholders.

The following 14 issues form the basis of our 2022 sustainability reporting (listed in order of importance).







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Four new materiality topics were added in 2022. These include the following:

**Workforce Inclusion, Diversity and Equity (IDE)\***

Reflecting the growing role of IDE as a factor in business success, and a topic that is increasingly important to our stakeholders

**Supply Chain Management\***

Acknowledging the rising importance of ESG management in our supply chain

**Talent Attraction, Retention & Development\***

Understanding the importance of top talent attraction, retention, and development for business operations and the mining and metals sector businesses affected by tightening labor markets

**ESG Transparency and Disclosure**

Recognizing the increasingly stringent disclosure requirements and the associated expectations from our external stakeholders

While air quality, waste, and regulatory compliance are no longer considered material sustainability topics, they remain important topics for our management. Accordingly, they are covered in this report. We also integrated regulatory compliance into other topics, which aligns with peer practice and trends, and addressed our economic performance in other Alcoa reports and materials.

[Read more: Alcoa Investors](#)

In the second half of 2023, we will perform a full review of the materiality assessment in line with the updated edition of the GRI's Universal Standards.

\*Included on Alcoa's list of "Tier 2" topics in a previous assessment.







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# Managing Responsibly

Good corporate governance is essential to business sustainability. We take an active approach to managing risks, maintaining a high standard of ethics, and working to meet compliance expectations wherever we operate.





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# Ethics and Good Governance

Acting with integrity is one of our Company Values. In Alcoa’s view, ethics are a key component of governance, enabling us to mitigate risks and foster an environment of transparency and accountability.

For Alcoa, good governance is synonymous with good business. Accordingly, our Board of Directors provides oversight of our operations, including strategic planning for sustainability.

Our ethics program also influences how we do business. We expect all of our employees to abide by our global Code of Conduct and Ethics. We take this a step further by providing employees with regular ethics training and access to a whistleblower hotline. We also prohibit any form of corruption and bribery, and we are committed to conducting our business in accordance with all applicable data privacy laws and regulations.

Effective risk management goes hand in hand with good governance. We actively monitor risks to our business, including environmental and social risks. This monitoring also extends to regulatory compliance across our operations.

[Read more: Our Values](#)





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**ETHICS AND GOOD GOVERNANCE**



# Ethics

Our Code of Conduct and Ethics expresses the moral framework that governs our behavior and business conduct worldwide. We expect all of our employees to act ethically and to hold themselves accountable when interacting with our customers, communities and each other.

Our Ethics and Compliance (E&C) organization is responsible for promoting an ethical culture and preventing, detecting and responding to potential violations of our code, policies and procedures. These measures are designed to maintain dedicated ethical standards and uphold our standing as a good corporate citizen.

[Read more: Code of Conduct and Ethics](#)

## Communicating and Training

We promote a speak-up culture so employees can share their ideas, opinions and concerns. We rely on our various internal communication channels, including our Company's intranet and a quarterly E&C newsletter, as well as the provision of regular training courses to reinforce this people-centric approach.

Our global network of Integrity Champions also communicates and reinforces ethical behavior at all our locations. These employee volunteers enable ethics and compliance to remain at the

forefront of our business, promoting a culture of integrity, raising awareness about ethics and serving as trusted advisors.

All Alcoa employees are required to complete our annual Code of Conduct and Ethics training. Salaried employees must also complete annual trainings regarding anti-corruption and data privacy.

**Our other training includes:**

- ✓ Live anti-corruption training for employees whose specific roles put them at a higher level of risk
- ✓ Respect in the workplace training that covers expectations for leaders, a help chain to report concerns, and potential consequences for failing to address inappropriate behaviors

Salaried employees also annually complete the Business Conduct Survey, which requires the disclosure of any actual or potential conflicts of interest.

### Code of Conduct and Ethics Training Topics

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







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## Reporting and Investigating

Operating with ethics and transparency is vital to enhancing our reputation and maintaining compliance. One channel we use to uphold these standards is our confidential Integrity Line through which employees and external stakeholders can submit ethics-related questions or concerns or report suspected breaches of laws, policies or our Values.

[Read more: Integrity Line](#)

The Integrity Line is accessible 24/7 in multiple languages. Members can also submit anonymous reports online via the Integrity Line website, email or postal mail.

In 2022, 12 percent of the submissions to the Integrity Line resulted in disciplinary action, and 52 percent were inquiries or other matters that did not require investigation or substantial follow-up.

Most submissions (70 percent) were employment related, with the remainder related to business integrity, safety and health, human rights and general inquiries.

All issues and concerns reported through the Integrity Line are received by an independent company, which directs them to our E&C organization for follow-up.

Our Issue Reporting Policy and Financial Fraud Reporting Procedure offers guidance on the issues that must be reported to the E&C organization—including any allegation of corruption. All actual or suspected incidents must be reported to the Chief Ethics, Compliance and Privacy Officer within 24 hours or as soon as reasonably possible.

## INTEGRITY LINE PROCESS

### 1 Reporter Status Updates

Reporters are given private codes that 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.

### 2 Internal Review

Our E&C organization conducts an initial review to determine the best course of action. When appropriate, the E&C organization sends the matter directly to approved investigators at the relevant Alcoa locations. If an investigation is not appropriate for a location, our E&C organization handles the process.

### 3 Investigation

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.

### 4 Final Determination

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.





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## Anti-Corruption Program

We explicitly reject all forms of bribery—the giving or receiving of anything of value—aiming to persuade a recipient to misuse their position or create an improper business advantage. Our robust processes are designed to prevent bribery and ensure our compliance with anti-bribery laws in the countries where we operate, including the U.S. Foreign Corrupt Practices Act.

We have designed our Anti-Corruption Policy and related procedures to address corruption risk. We expect all employees to understand and comply with our requirements.

[Read more: Anti-Corruption Policy](#)

Our anti-corruption program aims to meet or exceed applicable laws and forms an effective compliance program as recommended by the U.S. Department of Justice (DOJ). In addition, we do not operate any facilities in the lowest-ranked countries in Transparency International's Corruption Perception Index. (See our [Locations](#).)

Our E&C organization also supports our Supplier Sustainability Program, which manages supply chain risk for anti-bribery, anti-corruption and other ESG issues. (See the [Supply Chain Management](#) section.)

## Global Privacy Program

Our privacy strategy is designed to protect the interests of all employees, customers and third-party suppliers. Under our Global Privacy Program, we collect, store and use personal and sensitive information following legal requirements, regulations and contractual obligations. The program works to ensure that we comply with the General Data Protection Regulation (GDPR) requirements and other privacy laws in the regions and countries where we operate.

The Privacy Program Office (PPO) within our E&C organization manages the privacy program. The PPO comprises the Chief Ethics, Compliance and Privacy Officer and a privacy program manager, who manages day-to-day activities.

The PPO aims to create a culture of care and awareness to protect the personal data of Alcoa employees and those who work for our business partners. We do this through a risk-based strategy that includes change management, communication, policies, procedures, technology and training. Due to the nature of our business, we do not store or manage a meaningful 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 and a network of data protection liaison officers (DPLOs). The DPLOs are managed by our privacy program manager and are appointed representatives from the countries where we have a significant presence and in functions where considerable data processing takes place. They are elected by operational or functional leadership and are an extension of the PPO.

Our Data Privacy Standard details our approach to complying with international data privacy laws and regulations and defines the procedures that underpin our privacy program.

Our Privacy by Design Framework provides controls to ensure we consider privacy before purchasing, developing or implementing new services, systems or applications. The framework helps us anticipate, manage and prevent privacy risks in our system development, enhancement and procurement processes.

## 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 2022. As permitted by U.S. and state law, qualified Alcoa employees voluntarily donated approximately US\$11,500 to U.S. candidates for political office in 2022 through the Alcoa Corporation Employees' Political Action Committee.





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# Risk Management

The foundation of our risk management process is The Integrated Framework for Enterprise Risk Management (ERM) from the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

We also use the International Organization for Standardization's ISO-31000 (risk management) as a guideline.

[Read more: COSO](#)

In 2022, we continued implementing operational risk management (ORM) to evaluate and manage risks across our operations and connect them to enterprise-level risks whenever possible.

We focus on developing multi-layered, collaborative processes, to identify, monitor and manage risks. The Alcoa Board of Directors maintains overall oversight of our risk management processes and management regularly reports on specific risks that could impact our Company.







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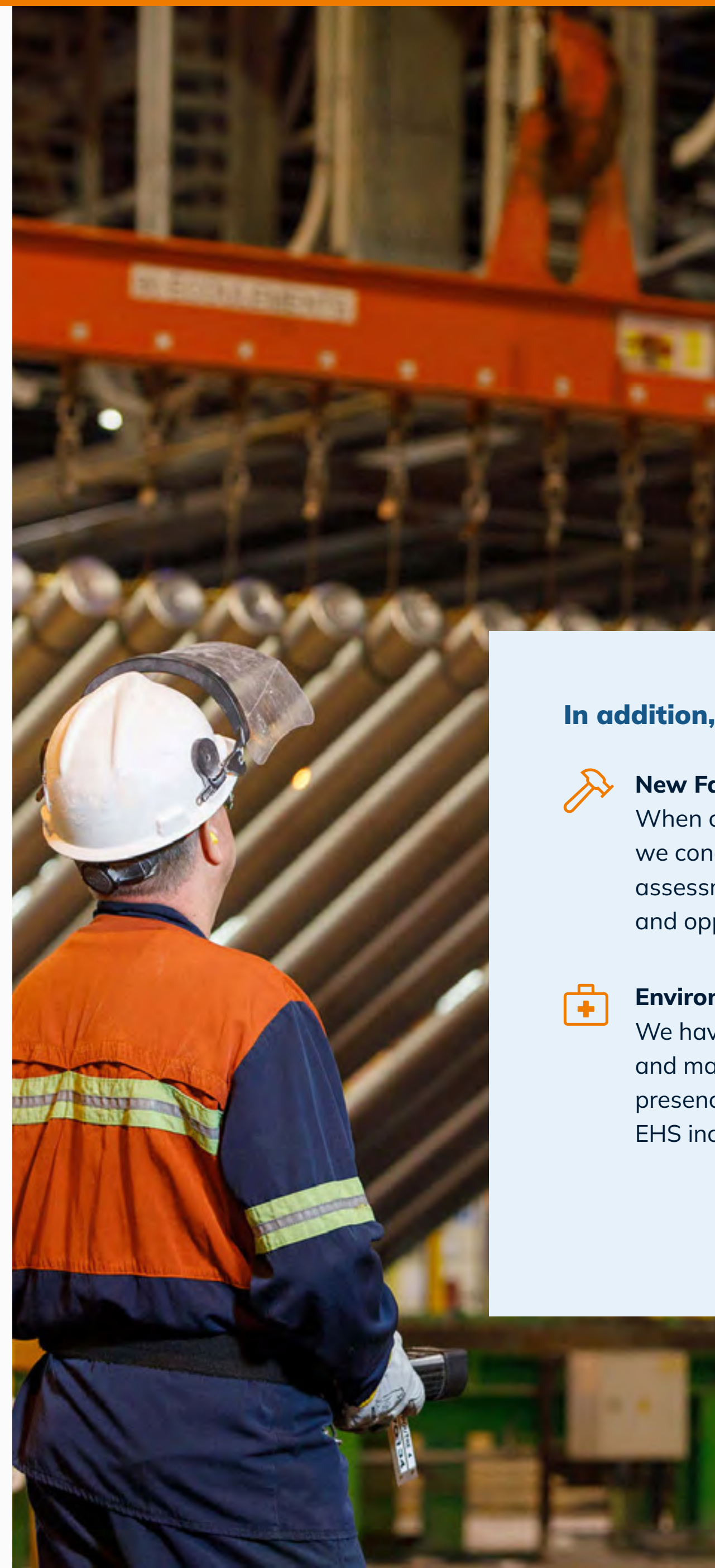
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We group risks into categories management can then assess, monitor and prioritize. Emphasis is placed on the likelihood of an occurrence, its level of consequence and other factors, such as vulnerability and velocity. This process includes an assessment of risks in light of key business drivers such as reputation, brand, operating margins and earnings.

We have linked our sustainability materiality assessment to our corporate risk management process as an additional input to guide our ERM process.

This step ensures a thorough assessment of sustainability-related matters to determine their potential impacts and establish the appropriate steps to manage them. Our ORM implementation also incorporates our materiality assessment to address sustainability risks that could impact our operations.

See our Annual Report on Form 10-K for the year ended December 31, 2022, for a discussion of our significant risks.

[Read more: Annual Report on Form 10-K](#)

**In addition, we use different risk management systems for specific business activities. These include:**



**New Facilities or Expansion Projects**

When considering new facilities or expansions, we conduct an environmental and social impact assessment (ESIA) to identify potential risks and opportunities.



**Human Rights**

We perform periodic human rights risk assessments and due diligence 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 that focuses on the presence of Critical Controls to prevent and or mitigate EHS incidents. (See the [Safety and Health](#) section.)



**Cybersecurity**

We use various cybersecurity risk management processes encompassing everything from third-party suppliers to vulnerability management. We are also working to align our global security program with the ISO-27001 Information Security Management standard.

[Read more: ISO-27001 Information Security Management](#)





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# Corporate Governance

Alcoa's commitment to ethics and compliance starts at the top. Our Board of Directors take an active role in Alcoa's governance, including our efforts in sustainability, while our management sets the tone for the entire organization.


 Alcoa's **Board of Directors** is responsible for risk oversight, including risks related to climate change. Committees of the Board are delegated responsibility for specific risks.

[Read more: Alcoa Governance](#)

 In 2022, we established a **Sustainability Governance Board (SGB)**, which is a subset of our Executive Team (ET). The SGB provides a dedicated forum to focus on the work of our CoEs while guiding and endorsing our approach on social sustainability, biodiversity and other material issues related to our sustainability strategy.

 Launched in 2018, the mission of the **Human Rights Council** is to define and oversee the Human Rights Policy and related oversight systems to enable Alcoa to respect and support individual and collective human rights affected by its operations. It is sponsored by two members of the ET who are responsible for oversight management and providing periodic feedback to the ET on progress. The council membership is comprised of representatives from different regions where Alcoa operates, as well as relevant resource functions.

[Read more: Human Rights Policy](#)

 Our **EHS Compliance Committee** is a management committee that oversees and monitors EHS compliance-related and associated risks. The committee consists of leaders from Internal Audit, Ethics and Compliance, Legal, and EHS. Our Chief Executive Officer, Chief Financial Officer and General Counsel also support the committee's work with quarterly compliance reviews.







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# Compliance

Meeting legal and regulatory requirements is essential to maintaining our operations, and the global scope of our work requires us to be mindful of various legal and regulatory frameworks around the world. We work diligently to ensure effective oversight and compliance across our organization.

## Legal and Regulatory Compliance

Under the leadership of our General Counsel, Alcoa's legal team bears responsibility for legal compliance and management of our legal risks.

As part of its 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 on a global team of in-house lawyers and outside legal counsel to achieve compliance objectives.

Our in-house lawyers are qualified and experienced in the nuances of legal interpretation for the primary jurisdictions where we have operations, specifically Australia, Brazil, Europe and North America. These expert lawyers are responsible for ensuring compliance with applicable laws and regulations in their respective jurisdictions. They also advise on reporting obligations and manage ongoing legal matters and proceedings. When needed, external counsel may be engaged to address specific areas of expertise or jurisdictions. As a matter of policy, all external counsel working on our behalf are engaged and managed with Legal Department oversight. Alcoa's legal team maintains knowledge of, and control over, our compliance efforts and any legal matters impacting the Company.







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

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

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

## Supply Chain

To ensure that all of our suppliers adhere to our high standards for quality, competitiveness and commitment to sustainability, we have supplier compliance programs in place. (See the [Supply Chain](#) section.)

## Environmental Compliance

As indicated in the previous section, our activities are subject to the laws and regulations of the various countries in which we operate. In many instances, our standards meet or exceed those required by local or regional jurisdictions.

Through our environmental compliance and incident tracking system, we can quickly address issues, track our progress toward goals and targets, and verify the effectiveness of our actions. We also use the system to manage iterations of our draft or final permit conditions.

We integrate environmental compliance assessments into our risk-based EHS assessment process. Each evaluation is based on a location's operational risk and customized to address its current needs and challenges. The assessment teams feature internal and external subject matter experts who collaborate with management at our project sites.

### In 2022, we received penalties for six water related non-compliance issues:

- Five minor penalties were received at our former smelter in Badin, North Carolina, for fluoride releases that were slightly above the permitted levels; and
- We received one penalty at the Intalco smelter in Ferndale, Washington, which is now closed. It had deficiencies related to its administrative spill prevention control and countermeasure plan.

In May 2022, the Company received a Notice of Violation (NOV) from the U.S. Environmental Protection Agency (EPA) for alleged violations under the Clean Air Act at the Company's curtailed Ferndale, Washington smelter from when the smelter was operational. The U.S. EPA has referred the matter to the DOJ's Environment and Natural Resources Division (ENRD). The DOJ and the Company are engaged in discussions with respect to a resolution of this matter.

### Environmental Non-Compliances

Year	Total	Significant	Penalties US\$
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
2022	6	0	102,867

We define a significant non-compliance as receiving a fine or penalty exceeding US\$100,000.

In addition to our internal compliance program, we also abide by our agreements with local communities, as well as the commitments acquired through various industry associations and partnerships, including ICMM.





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# ESG Transparency and Disclosure

Alcoa is committed to being transparent with our stakeholders about our social and environmental impact. We do this by aligning our disclosures with internationally recognized standards and best practices, including having our disclosures verified by a third party.

## Our Approach to Transparency

Transparency is paramount to maintaining the trust of our stakeholders, whether customers, shareholders, employees, regulators, or the communities in which we operate. Disclosing our ESG performance shows both progress and opportunities for improvement.

Underpinning this approach is the expectation that we demonstrate good stewardship by managing our risks and impacts and building a positive contribution to society.

In an effort to increase accountability and transparency, we routinely engage with ESG rating organizations and investors to better understand their expectations and reflect their priorities in our business activities and disclosures.

We also ensure that our sustainability report is subject to independent limited assurance.

The information in this report covers all operations where we have management control, unless otherwise noted. ESG metrics for the reporting standards relevant to Alcoa are referenced in [Appendix A](#).





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## UN Sustainable Development Goals

Alcoa is committed to doing our part to contribute to the UN SDGs, and we have aligned our sustainability practice accordingly. We have noted our progress against specific SDGs throughout the report, identified by the corresponding SDG icon.

[Read more: UN SDGs](#)







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## International Council on Mining and Metals and the Aluminum Stewardship Initiative

Alcoa is a member of ICMM and ASI. As a member, Alcoa is expected to meet the requirements of ICMM's 10 Principles, eight Position Statements and 38 Performance Expectations (PEs). In the case of ASI, Alcoa obtained certifications to the Performance Standard for two of its operating sites in 2022, bringing the total to 17 certifications. The Performance Standard outlines 59 sustainability principles and criteria relevant to the aluminum value chain.

In 2020, ICMM and ASI published an equivalency benchmark outlining how the principles in the ASI Performance Standard are equivalent to, or different from, ICMM's 10 Principles and associated PEs. The conclusion was that the ASI Performance Standard meets or exceeds 24 PEs, partially meets 12 PEs and does not apply to two PEs.

In response, Alcoa developed its own self-assessment approach to promote compliance with both ICMM and ASI requirements. The process includes the assessment of our operating locations to the ASI Performance Standard and the ICMM PEs that are not totally covered by the ASI standard.

By September 2022, all of our operating locations had conducted the self-assessment to the ICMM PEs. Overall, the results demonstrated that all of our operating locations met 94 percent of the applicable PEs. The remaining six percent of PEs were partially met. These include the following:

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

We have established corrective plans to enable compliance with the listed PEs. (See more in [Appendix A.](#))





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## 2022 ICMM PERFORMANCE

Our 2022 performance against the ICMM 10 Principles is indicated throughout the report using the following icons:



**Principle 1:  
Ethical Business**

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



**Principle 2:  
Decision-Making**

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



**Principle 3:  
Human Rights**

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



**Principle 4:  
Risk Management**

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



**Principle 5:  
Health and Safety**

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



**Principle 6:  
Environmental Performance**

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



**Principle 7:  
Conservation of Biodiversity**

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



**Principle 8:  
Responsible Production**

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



**Principle 9:  
Social Performance**

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



**Principle 10:  
Stakeholder Engagement**

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





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## Certification and Assurance

Alcoa retained the services of ERM CVS to conduct limited assurance of selected information from our sustainability report, including environment, health, and safety key performance indicators, as well as our adherence to ICMM membership requirements. All assurance was conducted in alignment with the International Standard on Assurance Engagements (ISAE) 3000 and ISO-14064:3.



The following items received limited ERM CVS assurance:

- ✓ Scope 1 and Scope 2 (location based method) GHG emissions data, including GHG intensity (refining + smelting)
- ✓ Scope 3 emissions: Total Scope 3 emissions, and totals for Category 1, Category 3, Category 4, Category 9, and Category 10
- ✓ Energy consumption, including fuels combusted onsite and, purchased electricity from renewable sources (smelters)
- ✓ Water inputs, consumption, and discharges from operating sites including water use for Alcoa-defined water-scarce locations
- ✓ Hazardous/nonhazardous waste generation and management, landfilled waste, and bauxite residue generated
- ✓ Active mine disturbance and mine rehabilitation
- ✓ Occupational safety and health data:
  - Events resulting in fatal or serious injury/illness
  - Incidents resulting in days away, restricted or transfers
  - Lost workdays
- ✓ Community complaints raised through the local complaint and grievance mechanism

The following ICMM Subject Matters (SM) were also assured by ERM CVS, which were selected based on their relevance to sustainability in the industry. These SMs serve to confirm that members are implementing the mining principles and PEs:

- **SM1:** The alignment of our sustainability policies, management standards and procedures to the ICMM principles and relevant PEs, 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 the approach 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; and
- **SM5:** Disclosures regarding the Company's prioritization process for selecting assets for third-party Performance Expectation Validation.

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

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.





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# Supply Chain Management

In line with our commitment to drive environmental and social progress, our procurement approach considers the entire life cycle of the goods and services we purchase. The strength of our supply chain also hinges on building long-term relationships with suppliers who share our commitment to operate in a responsible and ethical manner.

Though we see supply chain management as a critical component of good governance, it spans every aspect of sustainability, which is why mentions of how we address supply issues can be found throughout our sustainability report, where relevant.

Our Responsible Sourcing Program, encompassing our Supplier Standards and Suppliers Sustainability Framework, form the backbone of our supplier relationships. We are also working to enhance the diversity and inclusiveness of our supply chain by increasing the participation of people from underrepresented or underserved groups.

[Read more: Supply Chain and Supplier Standards](#)





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# Responsible Sourcing Program

Our Responsible Sourcing Program was enhanced in 2022 through an intensified focus on human rights and social performance. Actions included expanding our reporting through EcoVadis 360 Watch to track and monitor human rights controversies.

During the year, we uncovered:

- 2 potential discrimination and harassment controversies;
- 9 potential industrial relations issues; and
- 2 potential human right controversies.

[Read more: EcoVadis 360 Watch](#)

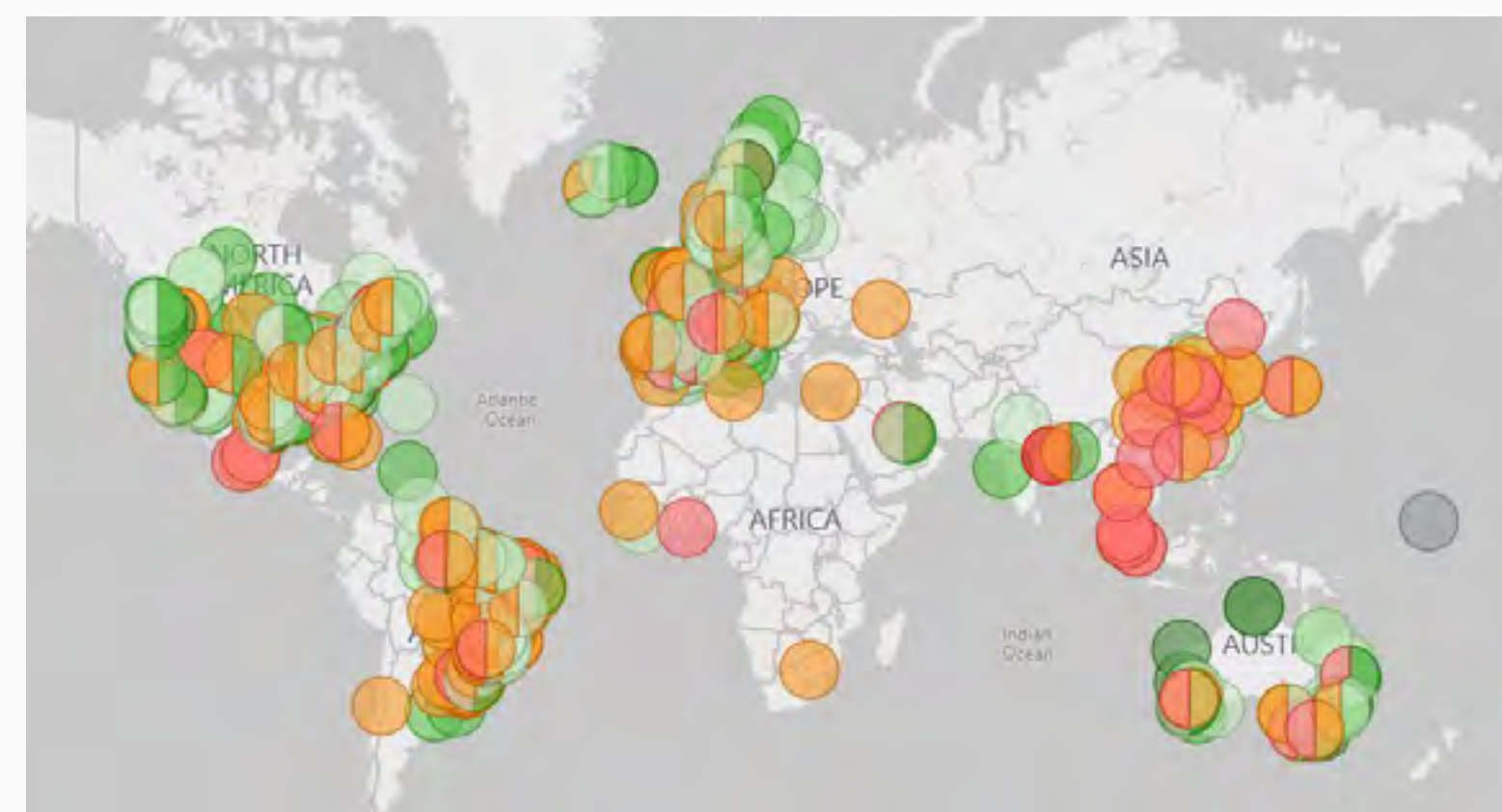
In partnership with Walk Free, we also continued our work with the Human Rights Resources and Energy Collaborative to develop a remediation framework and frequently asked questions guide to support the implementation of onsite human rights audits.

[Read more: Walk Free](#)

The development and integration of our new Supplier Site Collaboration (including onsite Human Rights Audit Protocol) and Supplier Sustainability Program aims to expand our knowledge of our supply chain and work more closely with suppliers to together build awareness, identify, and remedy human rights concerns. Our Supplier Site Collaboration program will begin implementation in 2023.

During the year, we also initiated the assessment and tracking of our raw minerals from conflict-affected and high-risk areas (CAHRAs) in line with the London Metal Exchange's responsible sourcing requirements. We are proud to report that all of our LME-listed brands met the required performance criteria.

## Assessment of Overall Supplier ESG Risk



- Very low
- Low
- Medium low
- Medium high
- High
- Very high







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## SUPPLIER AUDIT HIGHLIGHTS

**62%**

have an active whistleblower procedure

**48%**

are taking action to promote diversity

**82%**

have obtained access to EcoVadis Academy



To assist our procurement teams, we developed and conducted two training modules focused on our Responsible Sourcing Program and supply chain human rights. This training remains available to all employees through our OnDemand Procurement University. We also updated and delivered responsible sourcing and chain of custody training for our commercial teams.

We published our second Alcoa of Australia Modern Slavery Statement in line with Australia's Modern Slavery Act. Through our work with the Human Rights Resources and Energy Collaborate (HRREC), we participated in the Australian Human Rights Commission's engagement and Modern Slavery Act review process. We also improved our visibility and monitoring of maritime vessels through RightShip.

[Read more: Modern Slavery Statement](#)

While human rights and social performance were particular areas of focus for our Responsible Sourcing Program in 2022, we also continued addressing the environmental impacts of our supply chain. Below are some of the actions we took:

- Began developing our supply chain decarbonization strategy to support our goal of setting a Scope 3 emission-reduction target (see the [Climate Change](#) section);
- Assessed our refineries using a materials flow analysis (MFA) to identify key waste streams which could be reduced, and progressed our global [Waste Optimization Program](#), which extends to our supply chain; and
- Expanded our reporting requirements to improve visibility of our suppliers' water consumption and incorporated more relevant performance metrics in our key contracts.

### Measuring Our Impact

Supplier Performance Indicators	Number of Suppliers Percent
Actions on Energy Consumption & GHGs	60
ISO-14001 Certified	46
Global Compact Signatory	31
ISO-50001 Certified	7
CDP Respondents	31
Policy on Corruption	74
Responsible Sourcing Requirements Audit Assessment on CSR issues	44
Whistleblowing Procedures in Place	62
Actions to Promote Diversity	48





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# Supplier Sustainability Program

Through our Supplier Sustainability Program, we assessed more than 9700 suppliers (97 percent of our global supply base) in 2022, with 127 identified as potentially higher risk. Higher risk suppliers are required to undertake further due diligence through an EcoVadis Ratings audit.

[Read more: EcoVadis Ratings](#)

We track and monitor the effectiveness of our Supplier Sustainability Program not only through audit scores, improvement plans and 360 Watch findings, but also through leading indicators which help transform our supply chains for the better.

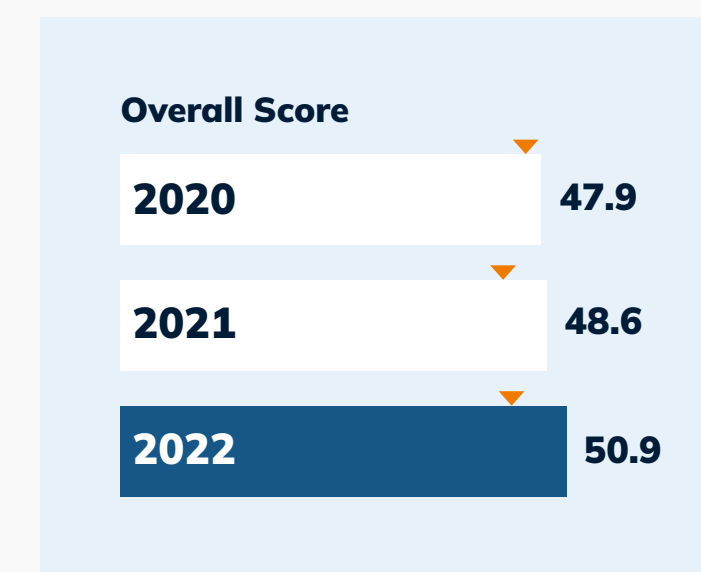
More than 1000 suppliers completed this audit (47 percent of our supply spend), with less than 39 percent completing it for the first time. Of the suppliers undertaking reassessment, 69 percent improved their score.

**99 percent of our audited suppliers met our minimum requirement score of 25 out of 100.** For those that fell below the threshold, we partnered with them to develop an improvement plan.

Overall, the average score was 50.9, which is 14 percent above the global EcoVadis network benchmark (44.6).

## Alcoa Suppliers Year on Year Performance

▼ EcoVadis Benchmark



Scores out of 100 possible points.

### Environment Score



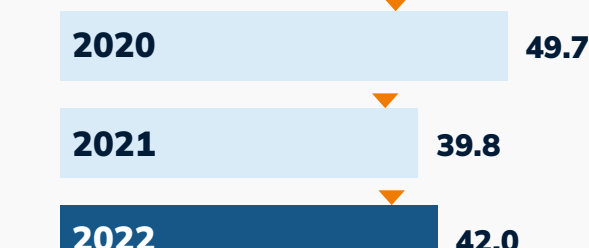
### Labor & Human Rights Score



### Ethics Score

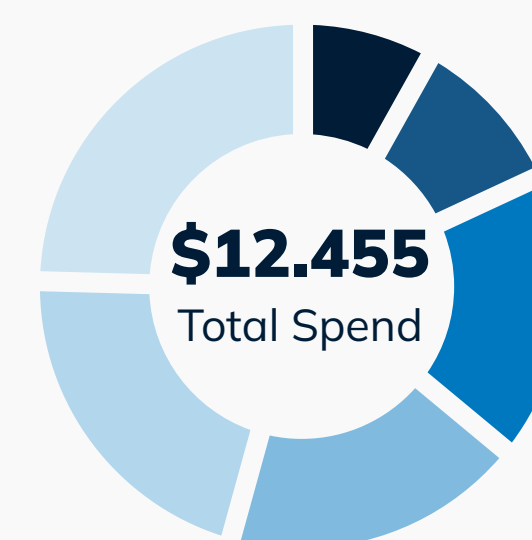


### Sustainable Procurement Score



## 2022 Spend by Region

Region	Supply Chain Spend US\$ Billions	Supply Base Composition Percent of Total Supply Base	Audited Spend Percent based on suppliers who have undertaken the EcoVadis Ratings Audit
Australia	2.58	21	51
Europe	2.59	21	54
North America	5.02	40	45
South America	2.27	18	50



## 2022 Top Spend by Commodity

US\$ Billions – Includes reserve and expense spend

- Transportation **8.02%**
- Corporate **9.88%**
- Bauxite & Metal **17.74%**
- Direct (Strategic Materials) **18.44%**
- Indirect (Material & Services) **20.49%**
- Energy **24.43%**





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## Supply Chain Spend

We purchased US\$12.46 billion in goods and services from nearly 10,000 suppliers around the world during 2022.

# Supply Chain Inclusion and Diversity

Our commitment to social responsibility includes championing inclusion and diversity throughout our supply chain. To enhance our Supply Chain Inclusion & Diversity strategy, we formed a partnership with TealBook in 2022. TealBook specializes in building inclusive supply chains through supplier identification and collaboration. Its registration portal makes it easy for suppliers to register at no cost and share their ownership structure, employee mix and supply chain partnership details. This information allows us to identify and recruit new suppliers from underrepresented or underserved groups.

[Read more: TealBook](#)

We also launched our Alliance Alcoa program for inclusion and diversity in Brazil. This program brings our largest onsite suppliers together to discuss and understand how we can collectively increase diversity within our workforce.

In Australia, the Alcoa Foundation made an additional investment in the Waalitj Foundation's employment and business support programs in 2022. This collaboration helps to connect Indigenous Australian suppliers with our operations, other major regional companies, our prominent onsite suppliers and provides them with access to business coaching services improving their ability to compete commercially.

### TealBook Supplier Diversity Categories

- Minority business enterprise
- Women-owned business
- Small business enterprise
- Veteran business enterprise
- Disabled veteran enterprise
- LGBT business enterprise
- Certified Aboriginal business
- HUB zone certified
- People with disability
- Disadvantaged business enterprise
- Women-led enterprise





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# Technology and Innovation

Technology is fundamental to Alcoa's vision to reinvent the aluminum industry. It has the potential to maximize growth and efficiency while solving some of the industry's toughest challenges. This is why technology oversight is an executive-level responsibility at Alcoa.



## Q&A with Renato Bacchi

Renato Bacchi, Executive Vice President and Chief Strategy & Innovation Officer, offers insight into how Alcoa aims to use innovation to advance sustainably and stand out from its competitors.





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**Q: Why is innovation important to Alcoa?**

Alcoa has a rich legacy of innovation. In 1886, 22-year-old, Charles Martin Hall, first developed aluminum production via a process known today as electrolysis, making it possible to produce aluminum economically. He later created a Company now known as Alcoa.

So, the spirit of innovation is in our genes as Alcoa employees. But we are not looking back only to admire our history—what’s in our DNA as a Company serves as a driving force for the future. It inspires our vision to reinvent the industry we created.

**Q: How is innovation driving business strategy?**

Today, aluminum is a critical material for our modern world, and its importance is only rising as long-term demand is expected to increase, driven by global trends toward decarbonization. Two growth areas are renewable energy (both generation and transmission) and electric vehicles, which require more aluminum than vehicles with internal combustion engines.

Not only do we need to meet the increasing demand for aluminum, but we also strive to help our customers meet their sustainability goals through our Sustana™ line of products that have lower carbon dioxide emissions than the industry standard. Society’s progress toward decarbonization requires not just incremental innovation, but reinvention.

**Q: How is Alcoa driving this reinvention?**

Our technology roadmap centers around three key innovations under development:

**ELYSIS™ Technology**

The ELYSIS™ partnership company was created by Alcoa and Rio Tinto in 2018 to ramp up a breakthrough process, first developed at the Alcoa Technical Center, to produce aluminum with no direct GHG emissions. It emits pure oxygen as a byproduct. The research and development (R&D) process is continuing, and good progress is being made, with commercial-grade metal being purchased by companies ranging from Apple to Audi.

[Read more: ELYSIS™](#)

**Refinery of the Future™**

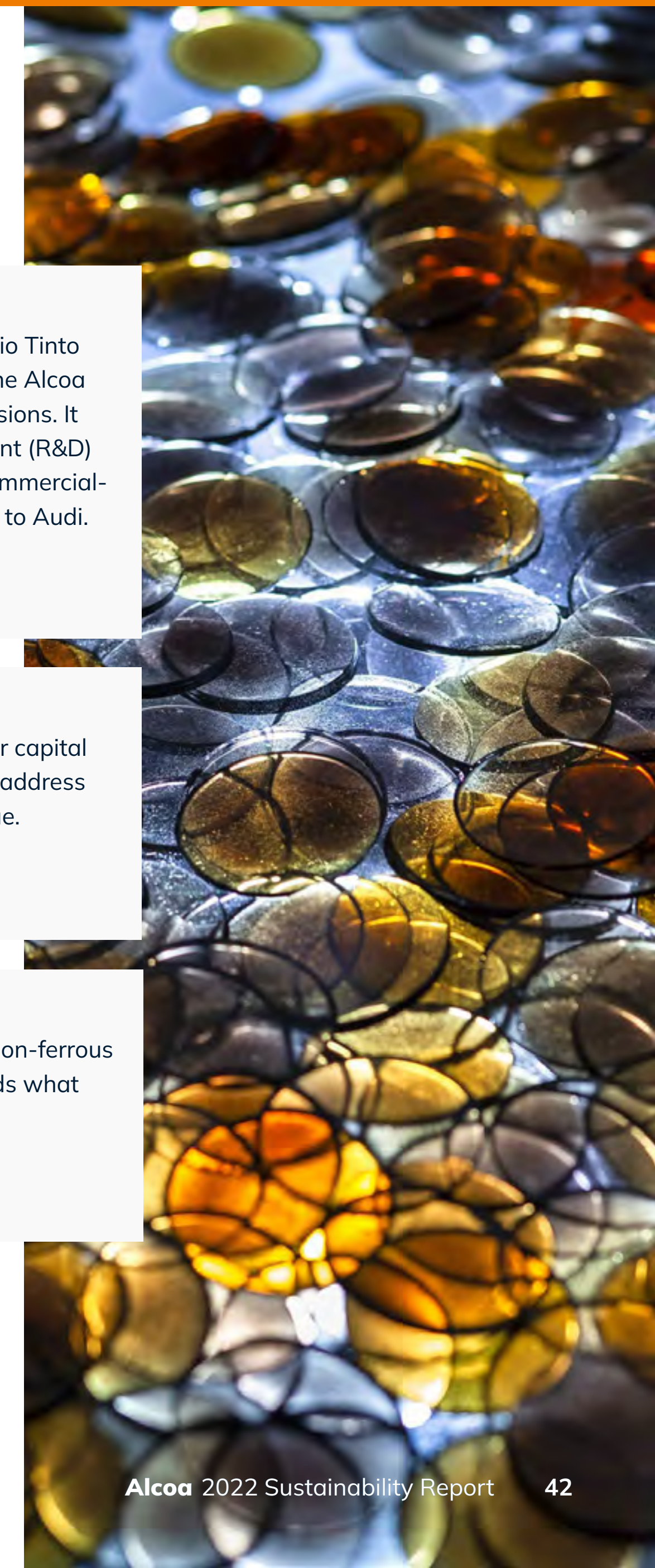
This initiative aims to design a refinery with the potential to lower capital intensity, eliminate GHG emissions from refining operations, and address other challenges, including reducing or eliminating bauxite residue.

[Read more: Refinery of the Future™](#)

**ASTRAEA™ Technology**

Recycling technology that can segregate and purify low-grade, non-ferrous scrap and produce aluminum at a quality benchmark that exceeds what most commercial smelters can produce.

[Read more: ASTRAEA™](#)







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**Q: How can the roadmap lead to the decarbonization of the aluminum industry and the realization of Alcoa's vision?**

Our pathways to support our net-zero by 2050 ambition will rely on two key items: the ongoing review of our global production portfolio and energy-related emission reductions at our facilities.

Second, we aim to achieve further GHG emission reductions through our R&D projects, including ELYSIS™ and Refinery of the Future™, which bundle numerous technologies and process improvements. From an emissions standpoint, the Refinery of the Future™ includes two primary innovations that we are working to adapt to refining:

**Mechanical Vapor Recompression (MVR)**

MVR can potentially replace all fossil-fuel energy consumed in boilers, allowing refineries to operate using electricity sourced from renewable sources such as wind and solar. With MVR, low-pressure steam is captured before it reaches liquid phase and is re-compressed back to the high-pressure steam needed for digestion. This technology alone has the potential to reduce an alumina refinery's carbon footprint by 70 percent and eliminate up to 35 percent of freshwater usage.

**Electric Calcination (EC)**

EC directly replaces a traditional, direct-fired calcination plant with one powered by electricity sourced from renewable sources such as wind and solar. Calcination is the final stage in the refining process where alumina hydrate crystals are heated to remove water molecules. The electric calcination process also allows 100 percent of the steam generated by the calciners to be captured and reused in the process, thereby significantly reducing water use. Electric calcination combined with MVR could reduce a refinery's GHG emissions by about 98 percent and reduce freshwater use by up to 70 percent.

**Q: What key technology or innovation milestones took place in 2022?**

In 2022, Alcoa continued to advance the work through our ELYSIS™ partnership, and we're working to scale up our ASTRAEA™ scrap purification process that could allow more post-consumer scrap to be used in products.

The ELYSIS™ partnership continues to scale up its carbon-free inert anode smelting technology. It has demonstrated the production of commercial purity aluminum, without any GHG emissions and at an industrial scale at the ELYSIS™ Industrial Development Centre in Saguenay, Canada. Work continues on building 450 kA cells at the end of an existing potline.

The ELYSIS™ technology is being designed to be used either as a 'drop-in' replacement to retrofit existing smelters or to build new ones. Design and engineering are underway for a facility producing proprietary materials fundamental to the ELYSIS™ smelting process.

**Q: What will be Alcoa's innovation focus over the next few years?**

We are motivated to see our breakthrough technologies move from R&D programs to adoption.

While the breakthrough technologies are expected to be part of our normal operations in the future, investing in R&D to meet market demand is key to enabling Alcoa to remain at the forefront of emerging aluminum technologies.





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# Our People & Communities

People are the backbone of Alcoa. We rely on our teams and our communities to thrive, and we reciprocate by working to promote their well-being.





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# Safety and Health

At Alcoa, we place safety and health at the core of our operations. We strive to equip our employees and contractors worldwide with the skills, knowledge and controls necessary to avoid injuries, illnesses and, most importantly, fatalities.

We promote a universal safety culture, supported by risk management and safety systems that aim to prevent all forms of accidents and injuries. We also monitor the health and well-being of our employees to prevent illnesses and help them perform at their best. Through our Care for People Value, we reinforce our goal that anyone who works at or visits our facilities returns home safe and healthy.





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# Safety

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

Fatality risk management is a fundamental aspect of our safety system. In 2022, we substantially retooled our critical-control field verification process, developing new checklists that are specific to unique risk profiles. These field verifications ensure that critical controls are in place to protect lives.

Human and organizational performance (HOP) is another fundamental aspect of our safety systems. It teaches employees how to anticipate and recognize situations where errors are likely to occur, to enable predicting, reducing, managing and preventing fatalities and injuries.

While our systems are designed to prevent loss of life or serious injuries, there was one serious injury in 2022 at our site in Massena, New York. A piece of rail track, which was being removed, struck a contracted worker, resulting in fractures and lacerations to the leg and hand. In accordance with our incident management system, we conducted a thorough investigation and root cause analysis and used the lessons learned to improve our critical controls, systems and tools and prevent future incidents.

Our 2022 FSI-P rate was 0.88 incidents per 100 full-time workers, which was a 17 percent decrease compared to 2021. Our days away, restricted and transferred (DART) rate slightly increased from 0.65 in 2021 to 0.67 in 2022. In 2023, there will be a continued effort on eliminating fatalities and preventing injuries through focused initiatives.

Additional data pertaining to our safety performance can be found in [Appendix C](#).

To make safety a universal goal, our OneAlcoa safety approach and comprehensive contractor management framework applies to all temporary workers, contractors and visitors.







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# Health

We work to maintain and promote the health and well-being of our employees and host communities.

To achieve this, we have implemented a four-pillar framework supported by a suite of internally developed global health standards. These standards fully align with applicable laws, and are periodically reviewed and enhanced to further our commitment to excellence and to anticipate directional trends.

## HEALTH VISION

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 host communities.



## HEALTH FRAMEWORK



### Health Hazards Controls

Preventing occupational disease



### Community & Public Health

Maintaining our social license to operate



### Personal Health & Well-Being

Enhancing personal health and well-being



### Health Status & Fitness for Work

Ensuring health status is compatible with assigned work





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## Health Hazard Controls

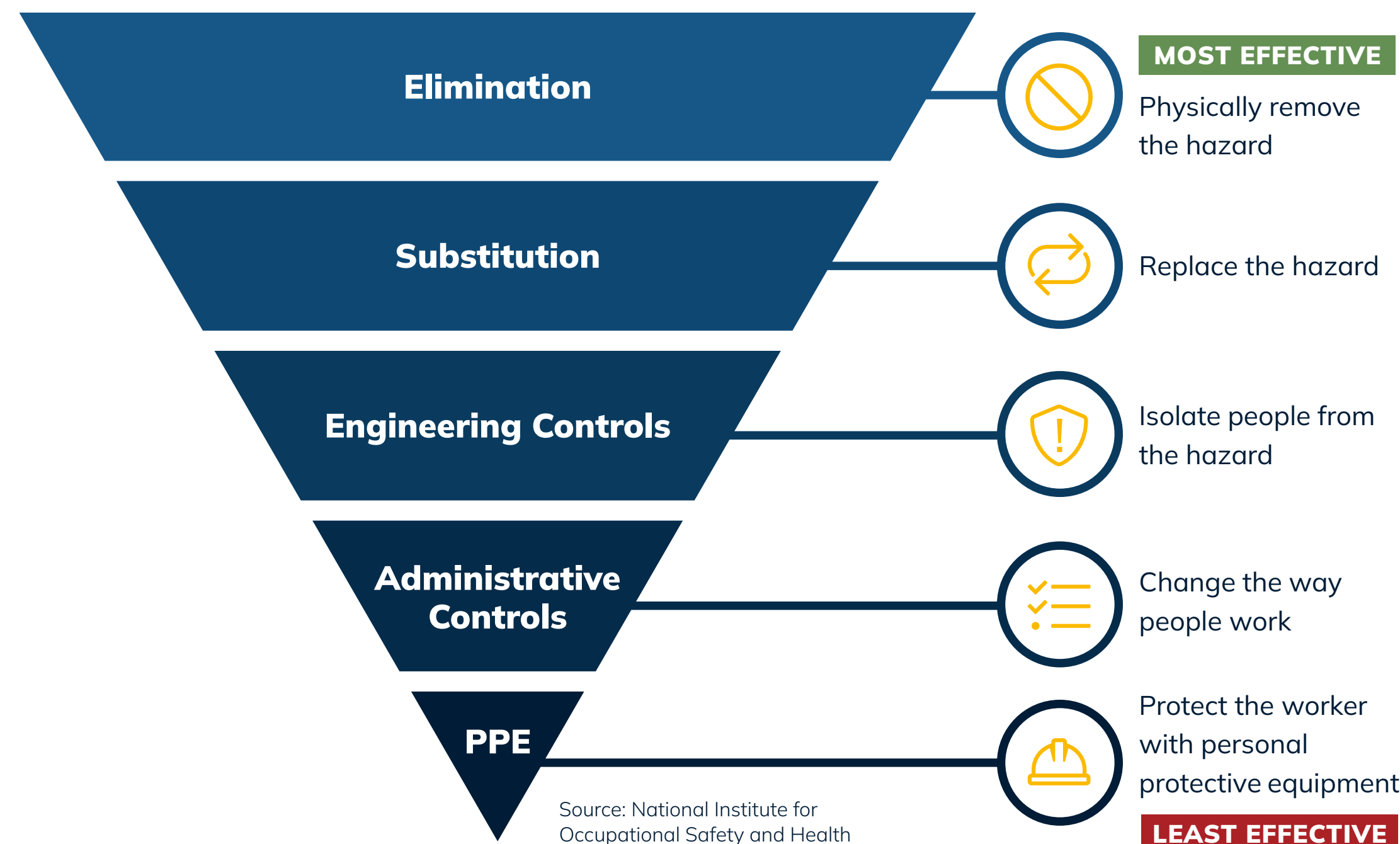
Due to the nature of our operations, chemical, physical (noise, ergonomic, radiation, heat and vibration), biological, and other types of hazards are present at various levels within our sites.

Our operations continually work to reduce and, where possible, eliminate exposure to these hazards. To achieve this, we apply a hierarchy of controls, use state-of-the-art approaches and employ advanced technologies, such as real-time personal physiological monitoring to gauge heat-stress risks.

Our key focus areas during 2022 included the ongoing assessment, characterization, management and control of the following:

- Emerging infectious diseases, including COVID-19;
- Occupational chemical, noise and heat exposures, with special attention on welding fumes;
- Fatigue risk management, particularly in our mining operations; and
- Health and well-being, including good work design (ergonomic) strategies and our Flexibility First initiative, which provides employees with more options to support work-life balance, including fully remote and hybrid models of working.

## HIERARCHY OF CONTROLS



A central element of our health management strategy is ensuring our employees and contractors understand the hazards and risks of their daily work. Our engagement channels include daily toolbox talks, annual hazard communication training, periodic topical updates and quarterly EHS reports.

Another core aspect is our comprehensive Industrial Hygiene Standard, which requires every operating location to have a qualified industrial

hygiene professional or consultant available to provide expertise support on technical matters. Our corporate and regional industrial hygiene managers also provide additional support when needed.

To help our contractors implement effective safety and health controls for their employees, we encourage a collaborative approach and share the industrial hygiene exposure data we collect, whenever it is appropriate to do so.





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## Health Status and Fitness for Work

Most of our locations offer comprehensive onsite occupational medicine services, which support our employees to perform their work confidently and safely.

### Select Occupational Medicine Services

- ✓ Chemical surveillance evaluations
- ✓ Fitness-for-duty assessments
- ✓ Hearing evaluations
- ✓ Lung-function testing
- ✓ Work-related injury and illness evaluation and treatment
- ✓ Substance use and abuse testing
- ✓ Job-related immunizations

Worker fatigue remains a significant risk factor in our industry. In response, we continued closing gaps identified within our global Fatigue Risk Management Standard in 2022 and shifted our focus beyond our global mining operations to include all operations. We also explored and deployed new preventive and mitigating technology controls at several high-risk operating locations. These controls include microsleeper detection and fatigue data analytics. After a successful run, they were incorporated into our standard.

## Community and Public Health

Throughout our international operations, we aim to become valued members of the communities where we operate. As part of this goal, we seek to identify ways in which our health experts can provide support and guidance to local medical and health professionals.

In 2022, we continued our involvement in a multi-phase project initiated by the International Aluminium Institute (IAI) and co-sponsored by ASI, focusing on the health impacts of climate change and ensuring the resilience of our operations and their adjacent communities. The project includes developing health literacy materials (funded by a grant from the Alcoa Foundation), an asset-level assessment tool and other support materials.

Alcoa served as principal-at-large since the IAI-ASI project's onset, providing sponsorship, partnership and facilitation assistance. Of particular importance are the interactions it facilitated between the project team and its Alumina site in Brazil – Alcoa's designated contributor for this phase of the project. The project co-sponsors plan to roll out resulting materials in late 2023 at a multi-stakeholder, face-to-face global workshop.

## COVID-19 Pandemic Response

Throughout the COVID-19 pandemic, our highest priority has been protecting the health of our employees, contractors, their families and local communities. Our locations have followed strict safety and health-based protocols to mitigate the risks.

During most of 2022, we continued adapting and scaling our pandemic response to local circumstances and public health requirements. We discontinued COVID-19 case reporting at the end of September 2022, after more than two years of tracking such cases. By then, reporting was no longer a requirement and our cases had dwindled. By the end of 2022, our locations had largely reverted to pre-pandemic practices or had permanently embedded preventative practices into their standard operating procedures.





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## Personal Health and Well-Being

In each region, we offer voluntary programs to promote and support personal health and well-being. These can include biometric screenings, nutrition programs, wellness competitions and various other activities. These activities are locally or regionally-planned, communicated and executed.

Some of our most successful well-being programs include our Thrive at Work initiative in Australia, which is a holistic, prevention-oriented approach to mental health at work. In Brazil, our Viva Vida program encourages employees to adopt and maintain healthier habits and lifestyles through various initiatives.

Beyond our well-being initiatives, employees can access non-occupational medical and healthcare services through Company-provided medical plans. We aim to facilitate direct referrals or provide advice to employees, when warranted, by location-based medical encounters or evaluations. We align these health services with governmental regulations, the availability and quality of local healthcare systems, provider availability, negotiated labor contract provisions, customs, contractor agreement specifications, demographics and other key considerations.

### Non-Occupational Medicine Services

- ✓ Assessment, stabilization and triage of urgent and emergent medical issues
- ✓ Limited health counseling
- ✓ Minor ailment advice and basic care
- ✓ Seasonal influenza vaccination

We also work with established and reliable emergency response capabilities in our host communities for both occupational and non-occupational medical emergencies. These services are typically provided through onsite or community resources.

### HEALTH INITIATIVES



Employee assistance programs



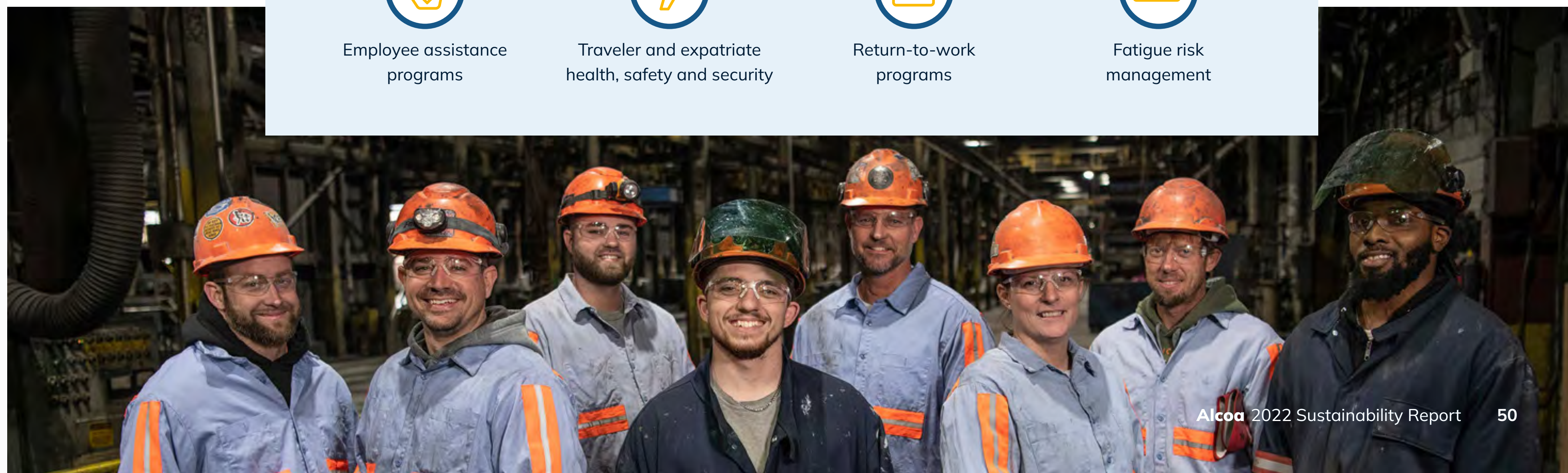
Traveler and expatriate health, safety and security



Return-to-work programs



Fatigue risk management







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# Human Rights

Operating in a diverse range of communities and regions worldwide, we endeavor to respect the interests, cultures, customs and values of all our employees and stakeholders. As part of our Values, we work to uphold human rights in all jurisdictions and areas of our value chain.

The Alcoa Human Rights Program includes our Human Rights Policy, due diligence, and remediation and grievance mechanisms. Detailed information on this program can be found on our website.

[Read more: Human Rights Policy](#)





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# Human Rights Program

Our due diligence process is incorporated in our internal human rights standard and deployed at our operations; our grievance mechanism is accessible through our compliance line.

[Read more: Integrity Line](#)

At the end of 2022, we had completed human rights impact assessments (HRIAs) for 18 operating locations.



The HRIAs identified the following salient risks within our global operations:

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

Using action plans, we are addressing these general and location-specific risks identified by our individual HRIAs. The Alcoa Human Rights Council is monitoring progress against the plans.

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

[Read more: VPSHR](#)

## Other progress in 2022 included:

Introducing **human rights and data privacy components** to our monitoring of non-controlled joint ventures

Establishing a **human rights practice area team** in our legal department to monitor human rights regulatory developments

Expanding our **auditing and work with suppliers** on human rights (see the [Supply Chain Management](#) section)

Delivering the **second Alcoa of Australia Modern Slavery Statement**. Alcoa of Australia identified no incidents of modern slavery during the reporting period

[Read more: Alcoa of Australia Modern Slavery Statement](#)





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# Indigenous and Land-Connected People

Throughout 2022, we continued engaging with Indigenous, First Nation and Land-Connected Peoples in Australia, Brazil, Norway, Suriname and the United States.

Alcoa is a proud sponsor of Festrival, the Festival of Indigenous Tribes of Juruti, Brazil. This is a celebration of the Indigenous culture in the City of Juruti and one of the biggest Amazonian cultural celebrations in place. It portrays local Indigenous culture through music, theater, allegories and dances. Pictured here is the Mundurucu Tribe. On the following page, the Muirapinima Tribe is pictured.





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**Australia**

We formalized our commitment to Indigenous, First Nation and Land-Connected Peoples in our Innovate Reconciliation Action Plan (RAP), which was endorsed by Reconciliation Australia in July 2022. This is our second Reconciliation Action Plan, building on 2020's Reflect Reconciliation Action Plan. Our reconciliation vision is to build stronger relationships with Aboriginal and Torres Strait Island people and communities to establish shared value. This is based on respect, including understanding their needs and aspirations.

[Read more: RAP and Reflect Reconciliation Action Plan](#)

Our Innovate RAP plan includes 15 actions with more than 70 deliverables to reach by June 2024, which aim to forge more inclusive and resilient communities. While developing this plan, we reflected on the crucial learnings from our prior plan and sought input and feedback from Aboriginal stakeholders regarding areas for improvement and focus moving forward.

By engaging our workforce and stakeholders in the Innovate RAP, we are contributing to an Australia that celebrates the rich diversity of First Nation People and understands and acknowledges the past to help create an equitable future across communities. The Alcoa Foundation also contributed to this goal in 2022, announcing another US\$450,000 to support Waalitj Foundation's employment and business support programs in Kwinana, Peel and Upper Southwest Australia over three years. It aims to boost business opportunities for First Nation Peoples in areas where we operate.

[Read more: Alcoa and Waalitj Partnership](#)



**Brazil**

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

Also, in July 2022, we signed a mining easement agreement with the Association of Prudente and Monte Sinai Communities (ACOPRUMS) that includes a payment covering 123 hectares (304 acres) for the entire period of easement. This is estimated at 20 years of occupation until the area is rehabilitated and returned to the landowner. The agreement also includes establishing a management committee and setting a specific budget for socio-environmental projects chosen by community members in the Prudente Monte Sinai area.

We have also engaged with traditional communities near our Juruti mine since its startup in 2009. Our relationship with the traditional community of Juruti Velho is based on a common land use agreement signed in February 2018 with the Association of Communities of the Juruti Velho Region (ACORJUVE), the National Institute of Colonization and Agrarian Reform (INCRA), and federal and state prosecutors. The agreement included landowner rights, royalties and compensation for any loss and damages to communities.

In October 2022, federal and state prosecutors revoked their recommendation for a foundation to manage the community's mining revenues (compensation and royalties) and instead required direct payment for families (60 percent) and ACORJUVE (40 percent). As a result, we expect to pay compensation for the 2006 to 2010 period in 2023. Loss and damage studies for the period 2011 to 2025 will start in 2023 and should continue until 2024.

To govern this process, we hold monthly meetings with ACORJUVE via a joint management committee. We also have an executive group with ACORJUVE and INCRA for dialogue and deliberation. From the mine's startup in October 2009 through December 2022, we paid US\$29.4 million in royalties to ACORJUVE.





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 **Norway**

Since 2011, the local Jillian-Njaarke Reindeer District has been in discussions with the Norwegian government and project developer Eolus concerning the Øyfjellet Wind Farm. The district claims the project threatens to negatively impact traditional reindeer herding practices that the Sami people have carried out in the area since at least the 17<sup>th</sup> century.

We signed a 15-year power purchase agreement with Eolus that helped finance the wind farm development. While we are not a party to the resulting legal case, we are engaging in ongoing dialogue to better understand the concerns of the Sami people and facilitate potential ways forward. (See the [Stakeholder Engagement](#) section.)

 **Suriname**

Although we ceased mining operations in Suriname in 2015, we continue engaging with Indigenous communities as we rehabilitate the mining sites. For example, in 2022, the Organisation of Kaliña and Lokono in Marowijne (KLIM) used an Alcoa Foundation grant to build capacity via income generation in eight of its member Indigenous villages in the Lower-Marowijne region.

Activities undertaken by the villages to preserve their culture, develop nature tourism and create employment included:

- ✓ Cleaning up ancestral areas and building lodging for villagers and tourists
- ✓ Developing nature educational materials
- ✓ Training community members as tour guides, tour operators and other tourism-related roles

With Alcoa corporate funding, a community development program in the Marowijne district built infrastructure, including henhouses, a poultry processing unit and boat ramps. In addition, the program provided training in sustainable poultry farming and other topics related to the new infrastructure. We formally transferred the project to the community at the end of 2022.

 **United States**

Our smelter in Massena, New York, is located on ancestral Akwesasne Mohawk territory. In 2022, the Alcoa Foundation awarded its first grant to Strong Roots Charitable Foundation, which supports the Akwesasne community. Strong Roots will work with Akwesasne Freedom School to build outdoor classrooms and integrate cultural values into the learning experience. Of note, the school is one of North America's first indigenous language immersion schools. We have committed to engaging and exchanging knowledge with the Akwesasne community to foster mutual respect and understanding.

[Read more: Strong Roots Charitable Foundation](#)







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# Local Commitment with Communities

At Alcoa, we recognize that our prosperity is tied to the well-being of our local communities. That is why we seek to understand their needs and aspirations. This exchange helps to build trust and forms the basis of our community impact strategy.



**Case Study highlight**

## Cultivating Seeds of Growth

Blending community development and climate action, Alcoa's tree seedling program in Juruti, Brazil, trains and pays local families to cultivate the seedlings used in our forest restoration efforts.

[Read more: Cultivating Seeds of Growth](#)





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# Stakeholder Engagement

Through transparent and regular engagement, we continually strive to establish a mutual understanding of historical contexts, existing concerns, and future opportunities.

In 2022, Alcoa employees had another year of meaningful and rewarding collaboration with stakeholders via direct, one-on-one interactions and through community consultation forums that comprise a cross section of local representatives.

To ensure that we fully understand our communities and perceptions with our stakeholders, we conduct periodic surveys. For example, in 2022, we contracted a third party to conduct a survey covering our three host communities in Québec, Canada: Baie-Comeau, Bécancour and Deschambault. Overall results showed that our reputation in these communities is strong.

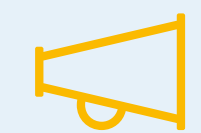


## Canada Host Communities Perception Survey



**81%**

find Alcoa trustworthy



**51%**

would advocate on behalf of the Company



**3%**

are considered detractors



**77%**

consider Alcoa as a positive player in the community



**94%**

believe Alcoa is an important source of employment





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We also engage with local communities through social investment opportunities from the Alcoa Foundation and Instituto Alcoa. In Brazil, we monitor the impact of these investments through periodic community panels.

Our locations manage their stakeholder engagement using our social performance management system, focusing on community risks, opportunities and feedback. The insight helps us better understand the economic, environmental, social and cultural issues that are important to our stakeholders and host communities.

Stakeholder engagement is also a key part of our human rights due diligence. This process allows individuals to provide input on their relationship with Alcoa and the effectiveness of established grievance mechanisms. Any stakeholder may call our confidential Integrity Line or submit their complaints via other available channels. Additionally, each country has local processes and channels in place to receive and address complaints that are raised locally.

[Read more: Integrity Line](#)

**Number of community complaints raised through local grievance mechanisms in 2022:**

[Australia](#): 100

[Europe](#): 5

[South America](#): 55

[North America](#): 4

For a list of key issues raised by or discussed with stakeholders in 2022, please see the Stakeholder Issues table in [Appendix D](#).





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# Shared Value Creation

For Alcoa, creating value is not limited to financial returns. It is also about driving better outcomes for our communities and broader stakeholder groups.

These outcomes promote better quality of life and prosperity—for people, and our ecosystems.

We make these outcomes possible by creating jobs, supporting local suppliers, and investing in our local communities through Alcoa Foundation, Instituto Alcoa and various funds set up for that purpose.

[Read more: Alcoa Foundation and Instituto Alcoa \(Portuguese only\)](#)

Detailed information on our approach, programs and initiatives can be found on our website.

[Read more: Alcoa Shared Value Creation](#)







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## Social Management System – SP360

Our comprehensive social performance management system, called SP360, helps Alcoa teams manage our efforts to create shared value.

SP360 became part of our operations in 2022, with a particular focus on implementation throughout our mining locations in Australia and Brazil. We'll expand the integration of SP360 across our portfolio in 2023.

SP360 is aligned with international best practices, including the ICMM Social Economic Reporting Framework—a framework launched in 2022 that we participated in developing as an ICMM member.

[Read more: ICMM Social Economic Reporting Framework](#)

The ICMM framework aims to give stakeholders, such as investors, governments and local communities, access to consistent and comparable data on an organization's contributions to social and economic development.

It is expected that ICMM members will begin reporting on seven of the eight core indicators in 2024 for their 2023 performance. The tax indicator will be required in 2025 reporting.

### ICMM Framework Core Indicators

- Workforce composition
- Pay equality
- Wage level
- Training provided
- Local procurement
- Country-by-country tax reporting
- Education and skills

## Mineral Revenues

By becoming a signatory to the Extractive Industries Transparency Initiative (EITI), Alcoa has signalled our support for enhanced transparency of mineral revenues.

[Read more: EITI](#)

ICMM members have committed to disclosing taxes paid on a country-by-country basis beginning in 2025. Alcoa has elected to provide this information on a regional basis as shown in the Economic Value table.

In addition, we provide information on royalties, fringe benefits taxes, payroll taxes and income taxes paid by the entities operating in our four active bauxite mining locations in Australia and Brazil. This information can be found in the Payments table.

Our Tax Policy outlines our work to comply in good faith with the tax laws and regulations in every country of operation and meet reporting and tax requirements.

[Read more: Tax Policy](#)

### 2022 Alcoa Economic Value

	Australia	Europe	North America	South America	Total
<b>Labor Costs</b> US\$ Billions	0.5	0.2	0.6	0.1	<b>1.4</b>
<b>Procurement Spend</b> US\$ Billions	2.6	2.6	5.02	2.3	<b>12.5</b>
<b>Income Taxes</b> US\$ Millions	193.9	45.4	259.4	19.9	<b>518.5</b>

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.

### 2022 Payments

US\$ Millions

	Income Tax	Royalties	Fringe Benefits Tax	Payroll Tax
<b>Government of Australia</b>	193.9	0.0	0.4	0.0
<b>State of Western Australia</b>	0.0	55.3	0.0	26.6
<b>State of Victoria</b>	0.0	0.0	0.0	1.1
<b>Australia Total</b>	<b>193.9</b>	<b>55.3</b>	<b>0.5</b>	<b>27.7</b>
<b>Brazil</b>	<b>7.0</b>	<b>10.0</b>	<b>0.0</b>	<b>4.9</b>

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

### 2022 Local Spend

	2021	2022
<b>Local</b> Percent	44	46
<b>Non-Local</b> Percent	31	31
<b>Non-Purchase Order</b> Percent	25	24
<b>Same City</b> US\$ Millions	710	1,034
<b>Same Country</b> US\$ Millions	3,621	4,641
<b>Non-Local</b> US\$ Millions	3,025	3,788
<b>Non-Purchase Order</b> US\$ Millions	2,488	2,908





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## Partnerships for Community Investment and Development

Catalyzing collective impact through partnerships is a prerequisite to addressing complex social or environmental challenges. Within our host communities and locations globally, Alcoa Foundation, Instituto Alcoa and Alcoa Corp. partner with numerous non-governmental and community-based organizations on social, environmental and economic development activities.

In 2022, the Alcoa Foundation partnered with Plan International to support the organization's climate resiliency work in São Luis, Brazil. Northeast Brazil is susceptible to the effects of climate change, including floods, high temperatures and spontaneous fires. The three-year project has two major components—a study of the socio-environmental risks associated with climate change and the mobilization of community members to respond to such risks.

[Read more: Plan International](#)

In Guinea, where we are a minority, non-operating partner in the Compagnie des bauxites de Guinee (CBG) mining company, we provided the Kenya Donse Fanyi organization with a grant to provide food processing training to women in the Boké mining region.

The goal is to preserve food grown locally, such as cassava and mango, to prevent food waste and malnutrition while providing participants with income-generating skills. By boosting women's economic participation, this project will ultimately benefit the entire community.

Photo Credit: Kenya Donse Fanyi



**Case Study highlight**

## Pocket Forests Transforming Urban Areas

Alcoa Foundation partnered with the Sustainable Poços Association (APS) to restore small fragments of native forest in public spaces across the city of Poços de Caldas, Brazil. Read the full case study for more details on how we are creating urban green spaces for the community.

[Read more: Pocket Forests  
Transforming Urban Areas](#)





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## Investing in Sustainable Development Around the World

📍 Global

### ALCOA FOUNDATION

**\$6.2M** in grants during 2022 (US\$)

The Alcoa Foundation awarded US\$6.2 million in grants during 2022. See the Alcoa Foundation annual report to learn how these grants support host communities.

👉 [Read more: Alcoa Foundation Annual Report](#)

📍 Brazil

### INSTITUTO ALCOA

**\$1.3M** invested in 2022 (US\$)

Instituto Alcoa is a non-profit institution that seeks to promote positive transformation in our areas of influence in Brazil.

In 2022, the organization invested more than US\$1.3 million in communities adjacent to our three major operations in Brazil: Alumar, Poços de Caldas and Juruti.

👉 [Read more: Instituto Alcoa \(Portuguese only\)](#)

📍 Canada

### ALCOA SUSTAINABLE COMMUNITIES FUNDS

**\$11M** invested since 2011 (C\$)

The Alcoa Sustainable Communities Funds invests C\$1 million each year for projects in the Baie-Comeau, Bécancour and Deschambault-Grondines/Portneuf regions of Québec. Projects are selected from a pool of ideas submitted through community forums and implemented by local organizations and/or individuals.

Since their creation in 2011, the funds have supported nearly 147 projects and invested approximately C\$11 million. A project that stood out for its far-reaching implications, and deservedly obtained funding in 2022, involves a network of greenhouses to be developed in Deschambault-Grondines and Portneuf. These greenhouses will produce fresh fruits and vegetables all year long and will offer these goods free of charge to various local food security initiatives, such as community fridges, collective kitchens and solidarity soups. In addition to addressing food security, the project will offer training greenhouse farming to local participants. The project will receive a total of C\$291,750 over three years.

📍 Australia

### ALCOA HARVEY WAROONA SUSTAINABILITY FUND

**\$3.8M** invested since 2008 (A\$)

Launched in 2008, the Alcoa Harvey Waroona Sustainability Fund is a partnership between Alcoa of Australia, the Shire of Waroona and Shire of Harvey to facilitate successful collaboration between Alcoa and the communities of Harvey and Waroona. It was kickstarted with a A\$400,000 Alcoa investment, which is added to every year based on alumina production from our Wagerup refinery.

Since its inception, the fund has supported more than 80 projects, invested approximately A\$3.8 million and been leveraged to generate an additional A\$20 million for the local community. One of the projects that broke ground in 2022 is the construction of the Waroona Community Precinct, which aims to revitalize the town center and provide local residents and visitors with an attractive destination.





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# Facility Stewardship and Transformation

Careful planning for the eventual closure and transformation of our facilities is a key consideration throughout the life cycle of each asset.

Working actively with local stakeholders, our goal is to transform closed assets for reuse or redevelopment, generating new opportunities, jobs and a tax base.

In 2022, we spent US\$132 million on stewardship and transformation projects at 36 locations. These included operating locations, locations we once operated or were operated by a subsidiary or predecessor, and divested facilities where we retained environmental responsibility.

### 2022 Transformation Spend

US\$ Millions

Activity	Spend	Number of Unique Locations
Mine Reclamation	45	6
Closure of Bauxite Residue Areas	30	6
Demolition	27	8
Environmental Remediation	26	13
Landfill Closure	4	3
<b>Total</b>	<b>132</b>	<b>36</b>

Includes reserve and expense spend.

Through funding to local non-governmental organizations, the Alcoa Foundation also helps communities where we once had active operations. In 2022, the Foundation made US\$410,000 in related investments.

To enable the success of project transformations, we actively engage with government agencies, community representatives, and other relevant parties on our post-operation strategy to optimize the land and assets. Some facilities require only a few changes, while others may need remediation, major modifications or demolition.

In cases where remediation is required, the protection of human health and the environment is our primary objective. We begin by assessing the environmental conditions using scientific methods and then identify remedial solutions that are protective, compliant, feasible and compatible with current or future uses, as well as our stakeholders' interest.







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## Major Transformation Projects

### ANGLESEA

📍 Anglesea, Australia

Maintenance and monitoring activities continue for the completed mine earthworks and rehabilitated vegetation areas, while we are working with regulators to explore the use of groundwater to support the mine void filling strategy. The closure and capping of the onsite asbestos landfill as authorised by EPA Victoria, has been completed, with planning for the remaining power station environmental remediation also underway.

We continue to engage key stakeholders including the community, regulators, government and traditional owners, and the Anglesea Freehold Concept Master Plan guides long term land use considerations.

### FUSINA

📍 Venice, Italy

Soil remediation at this former smelter and rolling mill is nearly complete, and we are engaged in active dialogue with authorities on additional steps to complete the remediation.

### LONGVIEW

📍 Longview, Washington, USA

Demolition of the smelter and cable plants began in 2022. The project, which was approximately 50 percent complete at the end of the year, includes removing aluminum smelter and cable plant buildings decommissioned in 2006 and 2007.

### MASSENA EAST

📍 Massena, New York, USA

In June 2021, we began demolishing 50 ancillary buildings that had been deemed unsaleable. The project was completed in November 2022 with 30,000 work hours and zero injuries, lost workdays and first aid cases. Approximately 7,500 metric tons of waste were transported to approved landfills and around 7,500 metric tons of steel, copper and aluminum scrap metal were recovered and sent for recycling. Demolition was performed in a way that enabled concurrent tenant reuse of the site.





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## POINT COMFORT

📍 Point Comfort, Texas, USA

Site-wide demolition of this former alumina refining site began in 2021 and was approximately 65 percent complete by the end of 2022. This included asbestos abatement. We initiated subsurface concrete removal and received regulatory approval to treat and release condensed alumina refining process solution via the site's National Pollutant Discharge Elimination System permit.

## POINT HENRY

📍 Victoria, Australia

Working closely with the environmental auditor approved by EPA Victoria, we continue to progressively develop and implement remediation action plans for this shuttered smelter and rolling mill. In 2022, we advanced the remediation of hydrocarbon-contaminated soils and backfilling work toward practical completion and are working to reduce the number of onsite landfills from three to two.

We continued engaging with the Victorian and local governments on the site's long-term land use. The Point Henry 575 Concept Master Plan envisions a mixed-use redevelopment.

## PORTOVESME

📍 Portoscuso, Italy

Soil remediation at this former smelter is complete, and agency verification of activities was underway at the end of 2022. We worked on groundwater strategies for the site and submitted a mitigation plan to authorities for review.

## ROCKDALE

📍 Rockdale, Texas, USA

Demolition activities were concluded in 2022 at the 33,000-acre site that used to house smelting operations. The year-and-a-half long project has achieved 60,000 work hours with zero injuries. The project involved removing more than 170 structures and transporting 12,000 metric tons of waste to registered landfills. Work began in March 2021 and was completed by July 2022. The remaining environmental remediation activities are expected to conclude in 2024. It should be noted that the site has been under new ownership since 2021.

## SURALCO

📍 Paranam, Suriname

Multiple scopes of work were actively underway at the end of 2022, with demolition, water treatment, mine rehabilitation and landfill remediation taking place during the year. About 53,000 work hours were spent mostly on breaking and removing concrete floors in the refinery area and demolishing oil tanks and small buildings. We processed approximately 15,000 metric tons of waste for containment in onsite landfills, and generated about 1,400 metric tons of recycled iron scrap and 3,500 metric tons of recycled concrete. There were zero environmental, safety and health issues during the year.

## WENATCHEE

📍 Wenatchee, Washington, USA

We began removing smelting pots, electrical support structures and all associated waste materials in 2022, with approximately 45 percent completed at the end of 2022.





## Sustainable Land Use

Our global Transformation Group also manages land around currently operating location. These parcels of land buffer our operations or contain mineral reserves for future mining. Where feasible, we provide access to this land for sustainable uses, such as the following:

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### FARMING

At 10 of our locations, we lease land to farmers who grow apples, cherries, corn, hay, soybeans and other crops. We also produce over 900 metric tons of alfalfa annually at our Addy, Washington, USA, location to feed elk and bighorn sheep during winter. At our closed Wenatchee facility in Washington, USA, a local farmer tends to 28 hectares (70 acres) of orchards. We lease out more than 300 hectares (745 acres) of farmland for crops and sheep grazing at our Point Henry site in Australia.



### LIVESTOCK

In the U.S. and Australia, cattle graze on our buffer land and other unused areas at several operating and closed facilities. In the U.S., we have 299 grazing cattle at our Addy location in Washington state, 70 at our Longview facility, also in Washington, and 399 at our site in Copano, Texas.



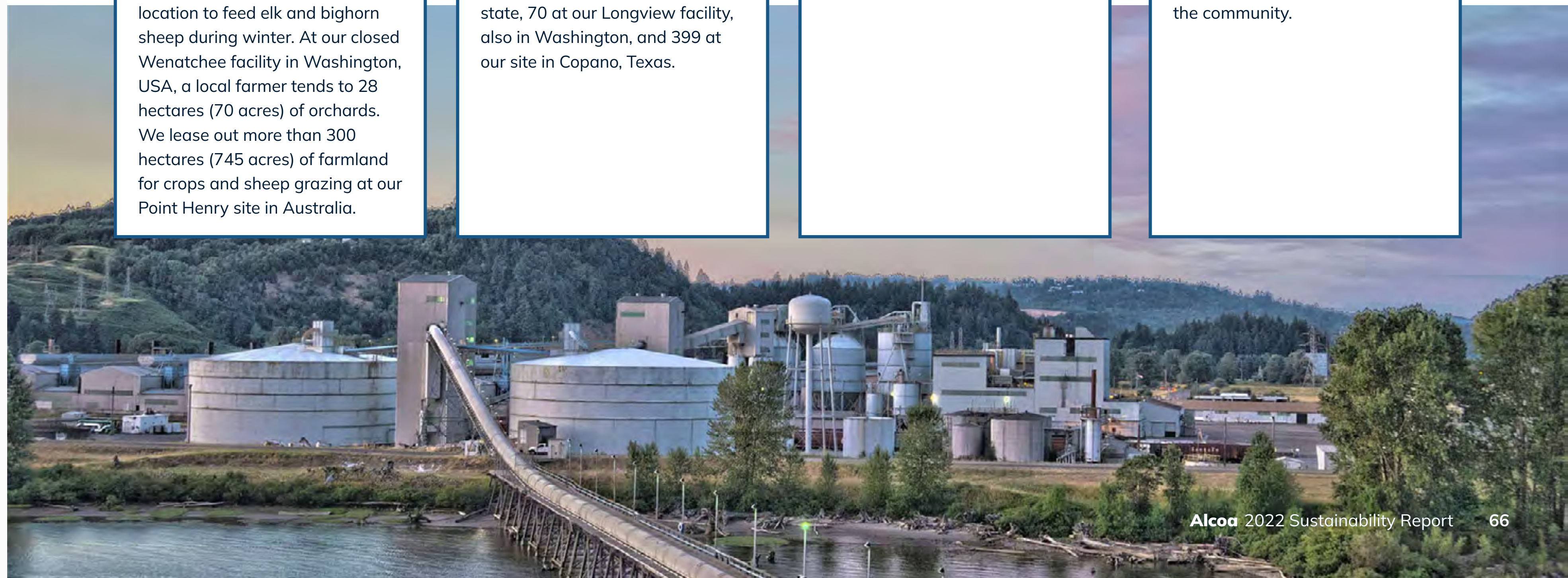
### MINERAL MINING

At locations where we have mineral resources beyond the coal and bauxite we require, we work with external consultants and miners to access some of these minerals in a responsible way.



### WATER

We share our water rights at various locations to benefit the community. We also manage water and reservoir levels at the dams we own to provide recreational activities for the community.







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# Inclusion, Diversity and Equity

At Alcoa, we strive to foster an “everyone culture” so our employees feel valued, empowered and respected, as an embodiment of our Values.

We work to promote practices that enhance collaboration and employee development to drive continuous improvement, increased engagement and world-class performance.

[Read more: Our Values](#)





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We are working to increase awareness of IDE issues in support of our aspiration to have an “everyone culture.” In 2022, we evaluated our progress in this regard and identified three areas:

**Strengthen Foundations**

**Build Awareness**

**Drive Accountability**

We have made significant headway over the last few years, achieving 51.26 percent of new hires from underrepresented groups in 2022. Driven primarily by the restart of our smelter in Alumar, Brazil, this result exceeded our internal target of 33 percent of underrepresented hires, as well as the 38.06 percent of new diversity hires registered in 2021. Women representation in our workforce also increased. (See the [Gender Balance](#) section.)

Building on our progress, we entered the next phase of our journey in 2022 by launching our Everyone Culture Framework and our Global IDE Policy.

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

In 2022, we provided our employees with new IDE content and updates through various resources and channels, including monthly newsletters. This Company-wide effort to promote awareness and engagement was complemented by several training opportunities focusing on IDE during 2022. The courses included supervisor training in IDE concepts, unconscious bias and cultural competencies.

As part of our ongoing IDE focus, we have identified areas where we intend to drive measurable and sustainable change. This work is informed by internal governing bodies consisting of the Global Inclusion, Diversity & Equity Council (GIDEC), our [inclusion groups](#) (IGs) and local committees.

The GIDEC’s initial purpose was to lead and champion strategic IDE initiatives via executive sponsorship. In late 2022, we shifted the council’s mandate to a more strategic governance model by establishing an Advisory Board.

We continue to work to create a workforce that more accurately reflects the communities where we operate through additional efforts like Everyone Matters, an ongoing and voluntary self-identification initiative. Engaging our workforce on these topics has helped us explore perspectives and gain an understanding of our employees and their needs, which has led to positive developments for Alcoa and our communities such as optimizing our branding materials to be more inclusive, exploring new opportunities to increase diversity at our global events, and continuing our analysis of IDE data to support our inclusion groups.



## Recognition

In 2022, we were recognized for our ongoing commitment to IDE. For example, we were named in the 2022 Bloomberg Gender-Equality Index and the Human Rights Campaign Foundation’s Corporate Equality Index 2022. Information about our additional recognitions can be found in [Appendix F](#).

[Read more: 2022 Bloomberg Gender-Equality Index and HRCF Corporate Equality Index 2022](#)

In 2023, we plan to continue promoting inclusion and diversity, with a specific focus on gender balance and the inclusion of underrepresented groups.

[Read more: Alcoa IDE Programs and Initiatives](#)

# 90 scored

on the 2022 Human Rights Campaign Foundation’s Corporate Equality Index

Out of 100 possible points.





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## Inclusion Groups

Alcoa made notable achievements in advancing its inclusion, diversity and equity efforts in 2022.

Our IGs played an essential role in continuing to build a more inclusive workplace and made a range of meaningful contributions. Their highlights included:



The **Alcoa Women's Network (AWN)** celebrated its 20th anniversary by sponsoring a global event on International Women's Day, featuring three female senior executives as panel participants. The AWN also held a travel webinar—She Travel—that included tips and resources for women traveling internationally.



**Employees at Alcoa for LGBT+ Equality (EAGLE)** hosted a global training session with PFLAG, and locations across the globe held events to show appreciation for fellow team members and allies in celebration of PRIDE month.

[Read more: PFLAG](#)



During the CEO Action for Diversity and Inclusion's Days of Understanding in late 2022, we announced the 2023 global launch of **Alcoans moving Beyond Limited Expectations (ABLE)**. This follows the group's 2021 launch in Brazil.

During the Days of Understanding event, we also hosted a **global employee forum** facilitated by our president and CEO, featuring Dr. Kerry Magro, a best-selling author and speaker on neurodiversity. Dr. Magro shared his own story, recalling how he transformed from a young, nonverbal child to a best-selling author and national speaker. His passion for helping organizations recognize the uniqueness of their employees and build environments where they can thrive provided an overwhelming sense of optimism.

[Read more: Days of Understanding](#)



**Alcoans Working Actively for Racial-Ethnic Equality (AWARE)** produced an insightful video raising awareness about celebrating our unique qualities and the accomplishments we can achieve as an organization when we embrace diversity. AWARE also hosted regional workshops to foster a stronger sense of belonging, discuss and overcome unconscious biases, and promote a culture of appreciation for individuals' differences at Alcoa.





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## Regional and Local Initiatives


In addition to our IGs' work, we conducted many other impactful events and initiatives at regional and local levels. Some of 2022's highlights included:


 Alcoa of Australia organized an awareness event in honor of **International Day Against Homophobia, Biphobia, Interphobia & Transphobia (IDAHOBIT)**. The event celebrates LGBTQIA+ people globally and raises awareness about the work still needed to combat bias and discrimination.


 We continued our **organization-wide development initiatives aiming to empower women**. These included programs to build their skills and capabilities within operations, expand their networks, prepare for new opportunities and enhance their soft skills.

 In the U.S., AWARE distributed **weekly Black History Month spotlight emails** to employees highlighting prominent African Americans and their contributions to American history.

 Our European locations held **open talks with employees on various IDE topics**, facilitated by plant managers and human resources representatives.

 We initiated two programs that **support the recruitment and retention of women and individuals with disabilities** in Brazil, Avisa que são Elas (Gender Equity Program) and Meu Lugar é Aqui (Disabled People Equity Program).

 In Brazil, we launched our first cohort of the ENABLE training program that **promotes the development of people with disabilities** and amplifies representation and awareness at all levels.

 Multiple locations **enhanced their diverse recruiting strategies, participated in events at local high schools** to drive awareness of Alcoa opportunities, **piloted flexible shift work opportunities** and offered **training in unconscious bias, cultural awareness and effective interviewing**.

We were the main sponsor of the first pride parade in Mosjøen, Norway. Photo Credit: Trym Solhaug







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## Gender Balance

We believe the desire to achieve gender equality is an intrinsic value of every successful organization, and we are proud of our ongoing progress toward this vital goal. In 2022, three out of eight Alcoa ET positions were held by women. This ratio is above the industry average of 12.1 percent<sup>1</sup>. The overall representation of females in our business grew from 17.17 percent in 2021 to 18.48 percent in the same year.

To recognize the exceptional value of our people, we are also dedicated to ensuring salaries support a normal standard of living. Reflecting our commitment to this goal our living wage study for 2021 identified no gaps.

In 2022, we also conducted our fourth gender pay equity analysis, supervised by a third-party consultant using robust statistical methodology.

<sup>1</sup>Source: S&P, 2023

We recorded the following findings on salaried employees:

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

Our 2022 inclusion and diversity incentive compensation target represented 10 percent of our incentive compensation formula. It included two diversity metrics: the percentage of new hires from underrepresented groups and an increase in the percentage of women in our workforce globally.



### Case Study highlight

## Promoting Gender Parity in the Workplace

Our Aluminerie de Bécancour (ABI) in Québec, Canada, has made great progress recruiting and retaining women at the smelter. In 2022 alone, 17 new female plant workers were added to its roster. Read the full case study to learn more about what ABI is doing to improve the gender balance of its workforce.

[Read more: Promoting Gender Parity in the Workplace](#)





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# Talent Attraction, Retention and Development

Our employees strive to fulfill Alcoa's purpose on a daily basis, by turning raw potential into real progress.

We understand that to remain competitive, we must aim to be the employer of choice. In 2022, our talent attraction efforts intensified. We have also sought ways to improve by soliciting feedback from our employees and continuing to offer valuable incentive programs.





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**4,208**

positions filled in 2022

**51.26%**

of new hires are from underrepresented groups

## Talent Attraction

Attracting the next generation of Alcoa employees is a fundamental task that involves continually expanding and diversifying our employment outreach.

In 2022, we used a variety of tools to identify and attract top talent, while working to keep our recruitment messaging consistent and unbiased. Recruiting events at colleges and universities have identified emerging local talent, and our internships and apprenticeship programs have further developed the workforce in the regions where we operate.

Despite a turbulent global job market, our recruitment efforts yielded positive results in 2022, filling 4,208 positions. Of these hires, 51.26 percent were candidates from underrepresented groups. (See the [Inclusion, Diversity and Equity](#) section.)

Our local communities have become an important focus of our recruitment efforts. We have increased our presence at community engagement events and are promoting our opportunities through direct communications, such as mail drops and newsletters. We have also developed “Life Pages” on LinkedIn that feature personal stories from employees in each of our regions.

As part of our latest Reconciliation Action Plan in Australia, we partnered with the Waalitj Foundation to attract local indigenous candidates and promote job opportunities.

In Brazil, we are working with various organizations to recruit individuals with disabilities. Our outreach efforts include sharing information about available opportunities with community leaders, as well as recruitment campaigns targeting this particular group. As a result, the number of applications from self-declared candidates rose.

To ensure that diversity remains a cornerstone of our hiring practices, we provide training to hiring managers and interviewers, reinforcing our Values. We also provide hints and tips on conscious and unconscious bias before interviews are scheduled with candidates.

In 2022, we revamped our global onboarding process and training for all new hires and their hiring managers. Our goal is to offer a best-in-class onboarding experience via a seamless and tech-enabled journey. We also built a new global orientation training solution for new hires to feel more connected to Alcoa by better understanding our business, our tools and their role.

We will continue aligning our advertising and outreach activities with current market trends and expanding our internal sourcing capability.





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# Talent Retention

## Employee Surveys

Feedback from our employees is highly valued, as it allows us to understand their opinions and concerns, assess current and emerging trends, and make sustainable progress as an organization.

In September 2022, we conducted our second Company-wide employee engagement survey. Approximately 60 percent of all employees participated, a substantial increase from the 44 percent in the April 2021 survey. We also received more than 10,000 unique comments, many of which were specific ideas for improvement.

Our overall engagement score was 75 out of 100, equal to the previous survey. Our top three strengths were intent to stay, work-life balance and authenticity. These results highlight that our employees appreciate the ability to bring their whole selves to work and the flexibility we provide to help them balance their personal and work responsibilities.

Our teams have now discussed the survey results locally, brainstormed ideas for improvement and agreed on new pathways forward. We focus on the opportunities identified by the survey, including additional staff coaching and development and specific items at the location and department levels.

## Total Rewards

In 2022, we continued offering both financial and non-financial rewards to our employees through our total rewards approach. We also linked 30 percent of our annual incentive compensation plan for certain salaried employees to non-financial metrics that are focused on safety, as well as inclusion and diversity.

For additional compensation information and data, see the Compensation Discussion and Analysis in our 2023 Proxy Statement.

[Read more: 2023 Proxy Statement](#)

## Labor Relations

We believe in freedom of association and actively engage with various unions across our global operations. In 2022, we had 31 active labor agreements covering approximately 70 percent of our workforce. (See the [Stakeholder Engagement](#) section.)





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# Talent Development

Since our inception, we have continually invested to equip employees with the tools and skills they need to forge long, rewarding careers with Alcoa.

A key focus of 2022 was our People Development Process (PDP). It includes educational materials to host meaningful check-in conversations between employees and managers, which are a core aspect of the PDP process.

We also focused on creating more modern learning solutions. We encourage our people to “provoke their growth” and learn anytime, anywhere. To further encourage self-guided learning, we also shared nearly 50 curated learning recommendations with our salaried employees to promote our Values and help them develop new skills. More than 1,200 employees enrolled in these voluntary courses, and the completion rate was 65 percent.

[Read more: Our Values](#)

We continued offering our leadership programs and expanded our Transformational Leadership Development program to North and South America, following its successful launch in Australia and Europe in 2021. By the end of 2022, nearly 50 individuals participated in the program.

Our Gigs initiative, where employees can apply for short-term assignments outside their normal routine, created more than 100 short-term development opportunities in 2022, enabling employees to expand their existing skills and develop new ones in different areas of the business.

[Read more: Gig Testimonial](#)

## 2022 Employee Training and Development

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

**4** formal classroom hours

**\$398** spent on tuition reimbursement (US\$)

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



Case Study highlight

## “Apprentice of the Year” Finds Her Perfect Hands-On Role

Megan Hazelden, Western Australia’s Apprentice of the Year, found her perfect hands-on role as a mechanical fitter at our Wagerup refinery. Read the full case study to learn more about Megan’s story and Alcoa’s commitment to training the next generation of tradespeople.

[Read more: “Apprentice of the Year” Finds Her Perfect Hands-On Role](#)







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# Our Environmental Stewardship

Long-term growth requires stewardship. From mitigating GHG emissions and improving efficiencies, to protecting land and water resources, we are actively working to reduce our environmental footprint.





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# Climate Change

As part of our strategic priority to advance sustainably, we are continually working to reduce our carbon footprint. Alcoa has set an ambition to achieve net-zero GHG emissions across our global operations by 2050 for direct (Scope 1) and indirect (Scope 2) emissions.

We are also on track to reduce GHG emission intensity from refining and smelting (Scope 1 and Scope 2) by 30 percent by 2025 and 50 percent by 2030 from a 2015 baseline.

To support our corporate ambition, we have a governance and operational framework to implement a strategy focused on decarbonization technology, renewable energy and low-carbon products. We also continue to identify and manage physical and transition risks associated with climate change.





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In 2022, we established a Climate Change CoE that brings together a range of experts to provide strategic climate leadership and advice, informing decision-making and ensuring cross-functional alignment with our Climate Change Policy.

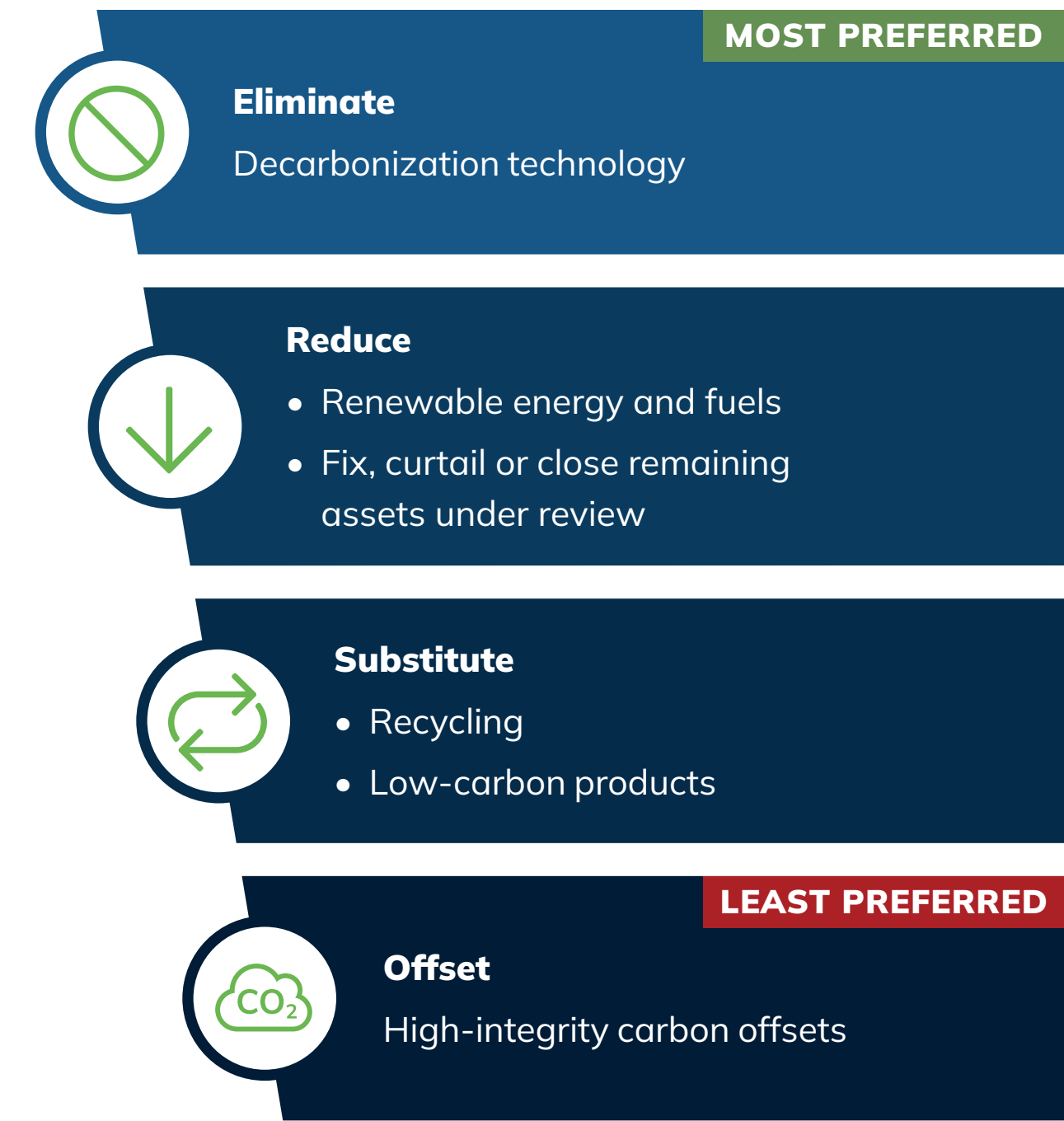
The Climate Change CoE reports through the Global Vice President for Sustainability to Alcoa's SGB.

[Read more: Climate Change Policy](#)

# Strategy

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

Our ongoing assessment of physical and transition risks allows us to refine our approach, respond to threats and capitalize on emerging opportunities while pursuing our strategy.







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## Decarbonization Technology

As one of the world's largest aluminum producers, we have a unique opportunity to drive real environmental progress and create lasting change. We work to continually innovate and create lower-carbon solutions through future-oriented research and development projects. These projects emphasize reducing or even completely eliminating carbon emissions in our alumina refining and aluminum smelting. They also aim to improve our efficiency and lower our costs.

In addition to smelting and refining, we have also started exploring decarbonization options in our mining operations. The initial stage of this exploration, which we completed in the first half of 2023, delivered a high-level qualitative assessment of the available technologies. This assessment provides a valuable roadmap for our future work and analysis.

### Our projects include:

#### Refinery of the Future™

Focusing on reducing the carbon footprint of alumina refining by creating advanced processes and technologies. We anticipate this project will provide the added benefit of reducing the capital cost of developing a refinery.

In 2022, this initiative received A\$8.6 million from the Australian Renewable Energy Agency (ARENA) and A\$1.7 million from Western Australia's Clean Energy Future Fund for testing EC. These investments complement an earlier A\$11.3 million grant from ARENA to develop our MVR technology further.

#### ELYSIS™ Technology

Our ELYSIS™ partnership uses technology that eliminates GHGs generated in the traditional smelting process. The research and development project uses proprietary materials and a next-generation design to emit pure oxygen. ELYSIS™ is working to ramp up the technology to a commercial scale and have it available from 2024 with commercial metal available approximately two years later.

[Read more: ELYSIS™](#)



### CASE STUDY HIGHLIGHT

## Process Optimization Yields Emission Reductions

In line with Alcoa's commitment to reduce its GHG emissions, our Lista smelter in Norway found ways to minimize emission-generating anode effects resulting from insufficient alumina. Read the full case study to learn more.

[Read more: Process Optimization Yields Emission Reductions](#)







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## Renewable Energy and Fuels

We believe embracing renewable energy is critical to powering a more sustainable global economy and creating a healthier planet for future generations. Looking ahead to this future means continually expanding Alcoa's use of renewable electricity and fuels throughout our operations. For example, in late 2019 we targeted increasing the amount of renewable energy consumed by our smelters to 85 percent by 2025, a benchmark that is also linked to our executives' long-term incentive program. In 2022, 86 percent of our global smelting portfolio was powered by renewable energy.

## Portfolio Review

We are continuing to evaluate our operating portfolio as part of the five-year review announced in October 2019. This review includes assessing opportunities for improvement and potential curtailments, closures and divestitures. Once we complete our review, we expect our operations to have the lowest average carbon emission intensity of all global aluminum companies.

## Low-Carbon Products and Recycling

Through our Sustana™ brand family, we offer a comprehensive portfolio of products made with lower carbon emissions. We are also working to increase the amount of pre- and post-consumer scrap we can recycle into high-purity aluminum. (See the [Products](#) section.)

## Offsets


In addition to expanding our use of renewable energy and improving our operating efficiency, we look to further reduce our climate impact via carbon offsets. In 2022, we evaluated our existing options to generate carbon credits in the context of our Juruti and Alumar operations in Brazil. We identified several potential future options from our consideration of relevant methodologies, market and technical analysis and local laws.


At our smelters in Québec, Canada, we meet eight percent of our compliance obligation with verified, high-quality carbon offsets. We purchased offsets approved under California Air Resources Board regulations (the Québec and California cap-and-trade programs are linked) and listed in the American Carbon Registry. The projects generating these offsets include a mix of forestry management, dairy digesters and mine methane capture/destruction.

Our Scope 1 emissions figures have not deducted any reductions created by offsets.


We expect to continue evaluating opportunities to invest in voluntary carbon offset projects, recognizing that nature-based carbon capture and sequestration can take considerable time to develop and mature.

### Steps to achieving our 2025 goal of 85 percent renewable energy consumed by our smelters:

 **Entering into wind power purchase agreements (PPAs)** for the future restart of our San Ciprián aluminum smelter in Spain

 **Securing new contracts with larger renewable energy sources** for our Portland aluminum smelter in Australia

 Initiating discussions with a range of potential partners to **use renewable energy and biofuels in our mining operations**

 **Entering into long- and short-term renewable energy contracts** for the restart of our Alumar smelter in Brazil

Additional information is available in the [Energy Use and Efficiency](#) section.





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# Risk Management

In alignment with industry best practices, we continue to analyze the two types of primary risks associated with climate change.

We are continually updating our climate scenario modeling in an effort to anticipate and manage the physical and transition risks associated with climate change.



## Physical Risks

These risks include acute and chronic changes in weather patterns that impact our operations, biodiversity management, host communities, suppliers and customers. Severe risks are generally event-driven and include heat waves, floods, storms and fires. Ongoing risks generally refer to longer-term changes to traditional weather patterns, such as above-average temperatures that can lead to droughts and rising sea levels.



## Transition Risks

The transition to a lower-carbon global economy continues to drive policy, legal, technology and market changes that vary in nature, speed and focus. We consider the risks associated with these changing external factors in our internal strategy discussions and long-term planning.

# Physical Risks ASSET RESILIENCE

We have initiated a global review of our assets to enhance our understanding of how the physical impacts of climate change may impact their resilience over time. To support this review, we will consider a broad range of climate scenarios, including those used by the United Nations IPCC.

In addition to this portfolio-level review, we are undertaking a detailed end-to-end review of the physical risks of climate change on priority impoundments to support our response to the revised GISTM. We will first review priority impoundments at our Kwinana location in Australia, San Ciprián in Spain, and two locations in Brazil—Alumar and Poços de Caldas. We will complete our global portfolio review and priority impoundment assessments in 2023.

We also continue analyzing the potential impacts of physical risks associated with climate change on our other operating sites and transformation locations. We plan to integrate these ongoing risk assessments into our existing site-level risk management process and corporate enterprise risk management framework, in addition to our broader climate adaptation planning.

## COMMUNITIES AND HEALTH

Beyond our own operation, it is also vital to understand and prepare for the physical impacts climate change may have on our host communities. Therefore, the Alcoa Foundation has invested in two important complementary projects that we expect will generate additional value for our communities.

✓ The **IAI project** focuses on understanding and preparing mitigations for the health impacts of climate change on communities and employees.

[Read more: IAI project](#)

✓ The **Alcoa Foundation** will study the potential socio-environmental impacts of climate change that could affect our host communities in Brazil through a three-year project based on research and evidence-based studies. This project will aim to raise awareness and engage communities to develop more effective climate adaptation plans.





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## Transition Risks

As a Company that has prioritized sustainability for many years, we are aware of the risks associated with the global net-zero transition arising from policy changes, markets and the pace of technology development and innovation. To enable us to remain informed and influence future policy effectively, we engage with a diverse range of stakeholders.

For example, we actively participate in various trade associations and industry-based organizations to understand and manage risks associated with changing government policies and legal landscapes. Our memberships include the IAI, European Aluminium, Brazilian Aluminum Association, Australian Aluminium Council, Aluminium Association of Canada, and the Aluminum Association in the United States. Our engagement with these organizations furthers the overarching goal to implement the Paris Agreement’s goals and objectives. Additionally, we actively participate in relevant ICMM and ASI climate-related discussions.

We also monitor carbon pricing data drawn from International Energy Agency (IEA) projections. In order to understand the connection between climate change and market-related risks, we consider potential carbon pricing in our internal long-term planning processes.

For example, in Australia, we actively engaged in the federal government’s reform of the Safeguard Mechanism to reflect newly legislated national decarbonization targets. With greater policy clarity about how emissions baselines will be reduced for industries covered by the mechanism, we hope to gain details for continued planning the decarbonization of our Australian assets. In addition, in the United States we are actively involved in the development of regulations associated with New York State’s Climate Leadership and Community Protection Act and its cap and invest program.

[Read more: Safeguard Mechanism](#)

In 2022, our collaboration with industry partners and stakeholders continued to help us understand and respond to transition risks.

### Our 2022 collaborative stakeholder activities included:

✓ Assisting in developing the “**Making Net-Zero Aluminium Possible**” report prepared by the IAI and Mission Possible Partnership (MPP). The report provided a sectorial-level 1.5°C-aligned transition strategy

[Read more: Making Net-Zero Aluminium Possible](#)

✓ Participating in the **Rocky Mountain Institute’s (RMI’s) Horizon Zero** workstream, an ongoing effort focused on harmonizing product-level GHG accounting and developing technical architecture to track emissions digitally

[Read more: Horizon Zero](#)

✓ Participating in **RMI’s Center for Climate Aligned Finance** initiative, which seeks to develop a methodology to determine the credibility and alignment of decarbonization pathways and transition the financial sector toward a zero carbon, 1.5°C scenario. We are a participant in an aluminum working group that was convened in 2022 and is expected to launch in 2023

[Read more: Center for Climate Aligned Finance](#)

✓ Continuing to serve as a founding member of the industry-led **Heavy Industry Low-Carbon Transition Cooperative Research Centre (HILT CRC)**, which aims to capitalize on the previous development of cutting-edge technologies and develop new technologies through R&D partnerships

[Read more: HILT CRC](#)





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# Metrics and Targets

In line with our ambition to achieve a short-term target of a 30 percent reduction in our GHG emission intensity, refining and smelting (Scope 1 and Scope 2) by 2025, we achieved a 25.1 percent reduction in 2022 from a 2015 baseline of 7.1 mt CO<sub>2</sub>e/mt Al.



## Scopes 1 and 2

In 2022, our carbon dioxide equivalent emissions were 20.8 million metric tons, of which 16.8 million metric tons were Scope 1 emissions. This is a 4.6 percent decrease in total emissions from the prior year. Our year-over-year emission intensity decreased by 1.7 percent.

Factors behind this performance included the curtailment of our San Ciprián smelter, a restart of the Alumar smelter powered by renewable energy and continued energy upgrades at the Portland Aluminum smelter.

We again engaged ERM CVS to provide limited third-party assurance of our carbon emissions data. (See the limited assurance statement in [Appendix B.](#))

### Carbon Dioxide Equivalent Emissions Intensity

Metric tons of CO<sub>2</sub>e per metric ton of production (IPCC, 5<sup>th</sup> assessment report)

Year	Refining	Smelting	Total
<b>2015</b> Baseline	0.55	6.06	<b>7.10</b>
<b>2019</b>	0.52	5.98	<b>6.96</b>
<b>2020</b>	0.52	5.08	<b>6.06</b>
<b>2021</b>	0.52	4.43	<b>5.41</b>
<b>2022</b>	0.51	4.36	<b>5.32</b>

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 emissions intensities conform to the IAI Aluminium Sector Greenhouse Gas Protocol using 100-year global warming potentials provided by the IPCC.

### Carbon Dioxide Equivalent Emissions

Million metric tons of CO<sub>2</sub>e

Year	Direct Scope 1	Indirect Scope 2	Total
<b>2018</b>	17.50	6.70	<b>24.20</b>
<b>2019</b>	17.70	6.60	<b>24.30</b>
<b>2020</b>	18.50	5.40	<b>23.90</b>
<b>2021</b>	17.40	4.40	<b>21.80</b>
<b>2022</b>	16.80	4.00	<b>20.80</b>

Alcoa reports on an operational control basis. Of our 20.8 million metric tons (M mt) of CO<sub>2</sub>e emissions in 2022, 20.1 M mt were associated with carbon dioxide, 0.55 M mt were associated with perfluorocarbon (CF<sub>4</sub> & C<sub>2</sub>F<sub>6</sub>), 0.08 M mt were associated with methane, 0.07 M mt were associated with nitrous oxide and 0.01 M mt were associated with sulfur hexafluoride (SF<sub>6</sub>). There were no significant hydrofluorocarbon emissions. We had 7,100 metric tons of biogenic CO<sub>2</sub>e emissions from the combustion of biodiesel. These emissions are not included in the total 2022 CO<sub>2</sub>e emissions. In 2022, 50 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 IPCC Guidelines and country-specific databases, such as Australia's National Greenhouse and Energy Reporting guidelines, continue to serve as our source of data for GHG applicable emission factors.





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## Scope 3 (Supply Chain)

In 2022, we hired a third party consultant to perform a review of our Scope 3 inventory and offer feedback for improvement. Based on this feedback, we expanded our inventory to include all fifteen Scope 3 categories as defined by the WRI GHG Scope 3 Protocol. Category 14 (Franchises) was deemed not applicable. In 2022, our Scope 3 emissions were 49.55 million metric tons from upstream and downstream categories. Upstream emissions represented about 21 percent of total emissions and downstream represented the remainder at 79 percent. Approximately 73 percent of our Scope 3 emissions come from the downstream processing of sold products.

We use an activity-based calculation methodology for our Scope 3 emissions and rely on upstream and downstream emissions factors from published sources and subscription-based services. We continue to seek inventory improvement opportunities by enhancing the quality of emission factors, moving from global to regional where possible. We are closely reviewing our upstream and downstream activities for reduction opportunities, including supplier/customer engagement to continue enhancing inventory accuracy and support target setting opportunities.

### Upstream Scope 3 Emissions

Million metric tons

	2022	2021	2020	2019	2018
<b>Purchased Goods and Services</b>	5.32	5.11	3.91	2.82	2.99
<b>Capital Goods</b>	0.80	-	-	-	-
<b>Fuel and Related Activities</b>	3.05	1.18	1.37	1.67	1.57
<b>Transportation and Distribution</b>	1.42	0.90	1.24	-	-

### Downstream Scope 3 Emissions

Million metric tons

	2022	2021	2020	2019	2018
<b>Transportation and Distribution</b>	0.45	0.37	0.03	-	-
<b>Process of Sold Products</b>	36.40	37.74	34.12	34.26	33.35
<b>End of Life Treatment of Sold Products</b>	0.30	-	-	-	-
<b>Investments</b>	1.77	2.15	-	-	-

Emissions are not compared year over year as Alcoa has sought to improve inventory scope and quality every year by expanding scope and seeking to use more primary data.

Waste generated in operations, business travel, employee commuting, leased assets (upstream and downstream) and use of sold products total less than 55,000 metric tons.

Alcoa reports their inventory on an operational control basis. Investments reflects emissions from Alcoa's equity interests.

## SCIENCE-BASED TARGETS

We understand there are evolving expectations around how companies and industries should independently verify the alignment of their decarbonization strategies with science-based targets. This area includes the work done by the Science Based Targets initiative (SBTi) for other sectors. We are anticipating the development of a methodology for the aluminum sector, but it is not yet available.

[Read more: Science Based Targets initiative](#)







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# Energy Use and Efficiency

By their nature, our refining and smelting processes are energy intensive, so our Company relies on maintaining access to large volumes of competitive and reliable energy supplies.

At the same time, as one of the world's largest aluminum manufacturers, we recognize that we can make an impact on climate by aiming to decarbonize processes and products. We are also working to improve our efficiencies and decrease our energy consumption through operational improvements and technological advances.

For our global operations, well-defined short- and mid-term energy efficiency targets are integrated into our overall GHG emissions reduction target. (See the [Climate Change](#) section.)





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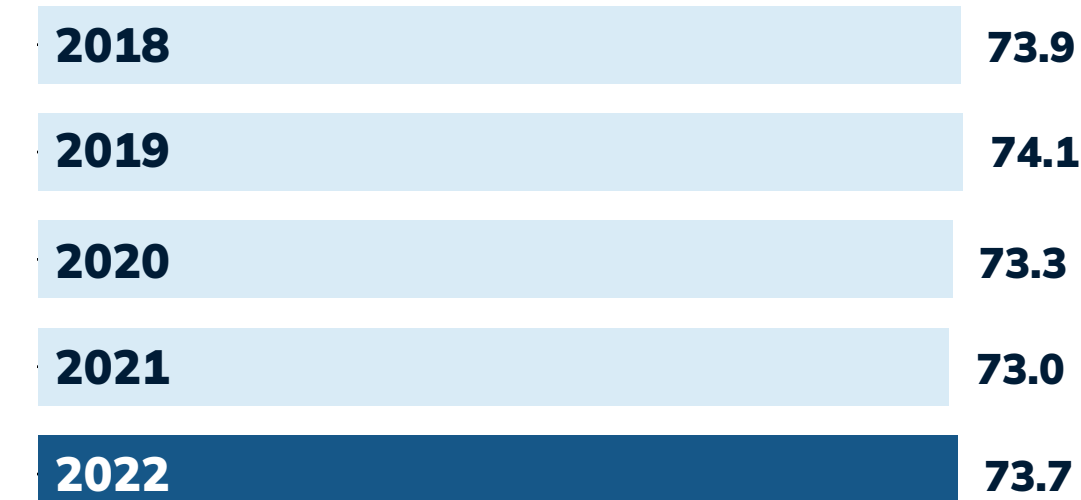
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We report our energy consumption based on management controls defined in the Greenhouse Gas Protocol. In addition, IPCC Guidelines and country-specific databases, such as the Australian National Greenhouse and Energy Reporting (NGER) Scheme, and the U.S. EPA'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.

ERM CVS provided limited assurance of our 2022 energy consumption data. (See the limited assurance statement in [Appendix B.](#))

### Energy Intensity

Gigajoules per metric ton of aluminum produced



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.

### 2022 Energy by Source

	Direct		Purchased Electricity	
	Thousands of Gigajoules	Percent	Thousands of Megawatt Hours	Percent
Natural Gas	96,157	54.3	3,951	10.6
Hydro	0	0	27,474	73.5
Coal	64,553	36.4	2,827	7.6
Oil	12,370	7.0	5	0
Other Renewables <sup>1</sup>	100	0.1	2,723	7.3
Diesel	3,631	2.0	201	0.5
Nuclear	0	0	190	0.5
Propane	292	0.2	0	0
Distillates	20	0	-	-
<b>Total</b>	<b>177,123</b>	<b>100.0</b>	<b>37,371</b>	<b>100.0</b>

<sup>1</sup> Other renewables including geothermal, biomass, solar and wind energy.

### 2022 ENERGY USAGE

↑ **0.9%**  
increase in energy intensity compared to 2021

↓ **4.1%**  
decrease in overall energy consumption compared to 2021, a reduction of 13.5 million gigajoules

### Key factors behind the performance were curtailments and restarts at these smelters:

- Lista in Norway
- Warrick in Indiana (USA)
- San Ciprián in Spain
- Alumar in Brazil
- Portland Aluminium in Australia

Operational challenges in Western Australia also impacted energy intensity.





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## Energy Security

In 2022, we purchased approximately 300 terajoules of natural gas per day and supplemented our self-generated power with approximately 2.9 gigawatts of purchased electricity. Around 40 percent of our natural gas and 80 percent of our electricity are secured under arrangements that exceed 10 years.

To determine resource generation mix, we take a location-based approach and utilize publicly available resource generation mix information. Smelters are Alcoa's largest consumers of electricity, and we have an internal target to achieve 85 percent renewable power consumption by 2025. Renewable sources comprised 86 percent of our global smelting portfolio's power consumption in 2022.

In 2022, Alcoa took a step forward in achieving its renewable energy goal by entering into two wind power PPAs. These agreements are part of the planned restart process for Alcoa's San Ciprián smelter in Spain, which is scheduled to commence in 2024. Both PPAs will be supplied by new wind farms currently in the permitting and development process. This is yet another example of Alcoa driving additional renewable capacity.

Alcoa's portfolio of renewable energy assets comprises equity interests in consortia and wholly owned facilities. Its share of the generation capacity of these assets is 1.5 gigawatts, of which 55.3 percent is sourced from hydroelectric power.

 **86%**

of our global smelting portfolio's power consumption is renewable



**2**

new wind power purchase agreements signed

## COMMUNITY INITIATIVES

In parallel with its progress relating to renewable energy, Alcoa is also improving the energy security of its host communities by voluntarily participating in demand response initiatives. In these programs, Alcoa can adjust the electrical consumption of a location to maintain local grid stability during peak demand periods. Demand response in large baseload industries like aluminum smelting is becoming increasingly important due to rising energy costs and the growing share of solar and wind generation.





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## Energy Efficiency

The four pillars of our energy efficiency approach aim to reduce our consumption through operational efficiency and technological advances.

At our refineries, we have implemented process control and improved our heat transfer efficiencies and maintenance. Our smelters have implemented an advanced manufacturing platform and more energy-efficient smelting pots. Our casthouses use advanced fuel burners, mixing technologies and furnace control systems to work toward their energy efficiency goals.

We continue investing in research and development to help our locations improve efficiencies. We also partner with our energy suppliers to identify opportunities to reduce our consumption.

For example, our Deschambault smelter in Canada meets with its major energy suppliers monthly and often invites their energy specialists to participate in its energy committee meetings.

## ENERGY EFFICIENCY APPROACH



### Benchmarking

We identify opportunities to compare our operations against industry leaders.



### University Collaborations

We collaborate with universities around the world to develop energy efficiency solutions.



### Best Practice Sharing

Through our internal CoEs, we share best practices and operational improvements across the Company.



### 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.





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## FEATURE STORY

# Powering Aluminum with Renewable Energy

In 2022, Alcoa signed two long term wind power purchase agreements that aimed to develop approximately 1.7 gigawatts of new wind generation capacity in Galicia, Spain.

The amount of baseload power that the contracts will deliver to support the future restart of San Ciprián smelter is determined by the evolution of the permitting and development of the targeted wind capacity.

The first agreement announced in May 2022 is with Greenalia, a local renewable energy development Company, and the second agreement, announced in October 2022 is with power company Endesa, a leading company in the Spanish electricity sector that is a subsidiary of the Enel Group.

Moving forward, we continue looking for opportunities to facilitate additional renewable energy capacity through power purchase agreements for San Ciprián.





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# Impoundment Management

Minimizing the impact of our impoundment facilities on surrounding communities is a priority for us. It is the reason why we actively work to mitigate potential risks through responsible management of impoundment facilities at our active, inactive and closed sites.

These facilities primarily store two types of material: washed bauxite mine tailings and bauxite residue, a standard by-product of the alumina refining process. For simplicity, we generically refer to both materials as “tailings.” We also have fresh and alkaline water dams.

We work to minimize our impact and, when possible, rehabilitate the land for further productive use. We have developed a range of measures and processes developed over decades of collaborative experience and development at our project sites.





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Our mandated Global Impoundment Policy guides impoundment management efforts, ensuring alignment with internal standards, guidelines, or applicable laws or regulations where we operate. In joint venture locations that are not operated by Alcoa, we use this policy to encourage best-in-class management and governance practices.

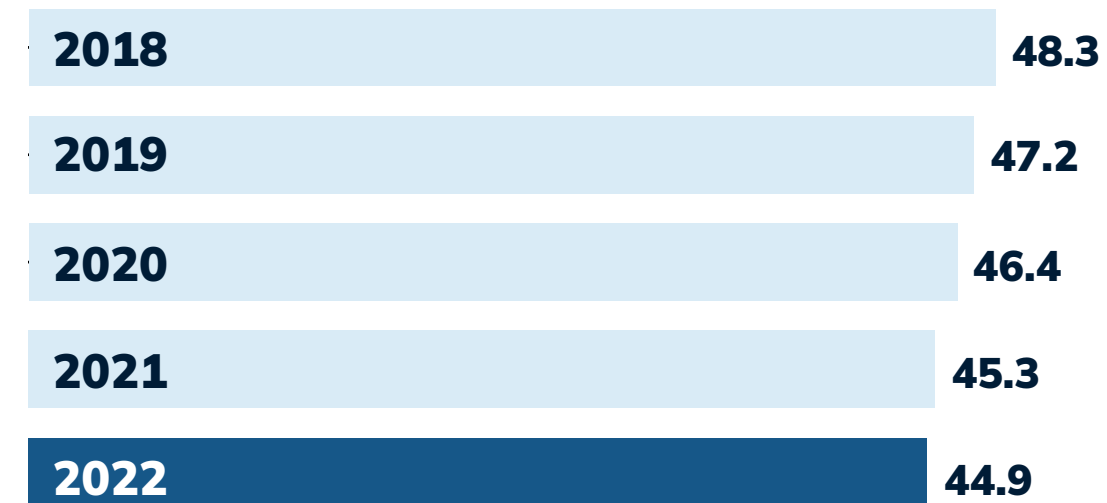
[Read more: Global Impoundment Policy](#)

We design, operate, maintain and close our impoundments according to mandated Alcoa Impoundment Standards and international standards, including the GISTM.

[Read more: GISTM](#)

#### Bauxite Residue Land Utilization Requirements

Square meters of land required per 1,000 metric tons of alumina produced



Data is for operational sites only.

We aim to continue developing new ways to reuse bauxite residue (mud and sand), including beneficial reuse for construction sand or a road base (cement feedstock, pavers, etc.).

## Construction and Design

One of the environmental risks of bauxite residue storage is alkaline water leaking into groundwater. To prevent this, our newly constructed storage areas include a composite-base high-density polyethylene (HDPE) liner and geosynthetic clay (or natural clay, if available). For extra protection, we also install a second HDPE liner above the geosynthetic clay and an underdrain system to drain water from the bauxite residue more quickly. These measures increase the bauxite residue's density and strength and reduce the hydrostatic pressure on the base HDPE liner, minimizing the risk of water leaking through the liner.

This liner system was incorporated into Alcoa's mandated Global Impoundment Engineering Standards more than 40 years ago, making us the first in the industry to do so. At some locations, our use of bauxite residue solids thickening/solar drying and dry filter cake further improves the drying and stability of our bauxite residue storage process.

[Read more: Impoundment Construction and Design](#)

## TERMINOLOGY

### Washed bauxite mine tailings

Clay, soil organics and other materials that remain after bauxite is washed with fresh water at the mine site.

### Bauxite residue

Mud, residual caustic soda and, in some cases, a coarse sand fraction.

### Impoundment

Any dam or other engineered structure intended to confine a body of water (fresh, alkaline or acidic), bauxite mine tailings, refining residue (mud/sand), coal ash or any other solid or liquid waste material.

## 2030 STRATEGIC LONG-TERM GOAL

# 15%

reduction of bauxite residue land storage requirements per metric ton of alumina produced from 2015 baseline

## 2022 PROGRESS

# 15.6%

reduction against 2015 baseline





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## Management Process

Over many decades, Alcoa developed processes to safely and effectively manage washed bauxite tailings and to effectively store bauxite residue. We continue to build on this work, integrating new internal best practices as we focus on maintaining the integrity and stability of our global impoundment facilities. Key elements of our Impoundment Management and Governance framework includes:

- ✓ The mandated Alcoa Global Impoundment Policy.
- ✓ An impoundment governance structure that provides global oversight to the impoundment's accountable executive<sup>1</sup>, with clearly defined location accountabilities and responsibilities.
- ✓ Compliance with location-specific regulations and globally mandated Alcoa impoundment standards covering planning, design, construction, operations, maintenance and closure.
- ✓ Long-term (25-year) impoundment strategic master plans and matching long-term capital expenditure plans for impoundment life cycle management and technology deployment.
- ✓ Review and assurance, including external third-party reviews of impoundment designs, and annual independent external third-party audits and inspections of all our facilities. This includes regulatory certification of tailings dams in specific countries, such as Brazil.
- ✓ For extreme consequence events, emergency preparedness and response plans require the development of hypothetical dam break assessments on credible failure modes and include scenario testing.

<sup>1</sup> Denotes defined role in the GISTM 2020, which we have adopted to govern impoundments.

We also apply an impoundment consequence rating system based on mandated local regulations, GISTM or our internal standards, whichever is most stringent. For example, in Brazil we use the GISTM consequence rating system and Brazilian National Mining Agency (ANM) regulations.

[Read more: Tailings Impoundment Database](#)

We work proactively to enhance the technologies that we use to store, manage and reuse tailings. We have spearheaded industry-leading research and engineering projects in managing impoundments that include:

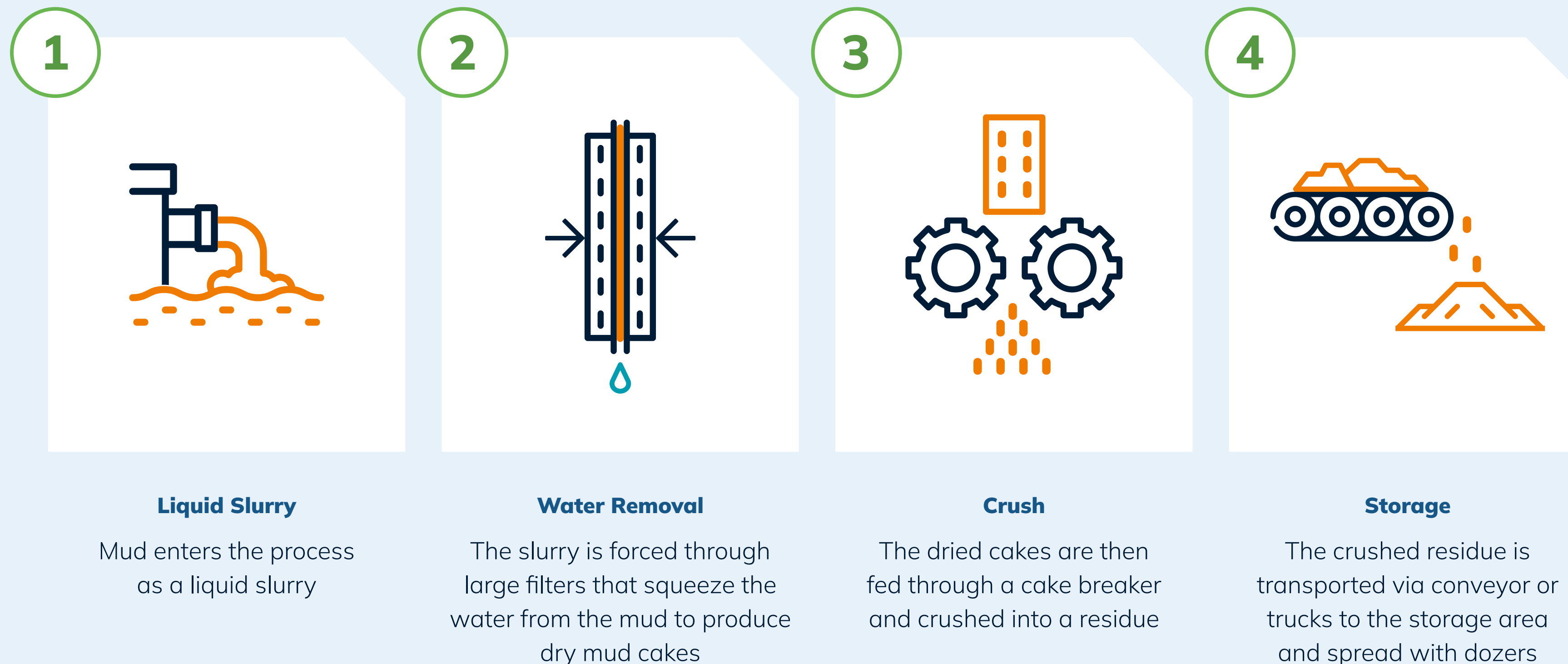
- ✓ Storing washed bauxite mine tailings at Juruti within the mined footprint to reduce land disturbance.
- ✓ Implementing bauxite residue filtration technology, where bauxite residue is forced through large press filters that squeeze water from the residue to reduce its moisture content; conserving water and thereby reducing the amount of land required to store the material.
- ✓ Where practical, progressively moving from traditional “wet” storage of bauxite residue to solar drying (thickened and using natural evaporation and dry filter cake stacking of filtered bauxite residue).
- ✓ Using underdrainage systems to reduce water pressure on the embankments and liner systems and allow the bauxite residue to dry and consolidate.
- ✓ Developing Redsand™ opportunities, where we wash and neutralize the alkalinity with carbon dioxide and sell the sand as construction or road material.

We have also transferred our successful learnings between countries. For example, the bauxite residue filtration facilities at our Kwinana and Pinjarra locations in Australia worked so well that we adapted the technology at our Poços de Caldas location in Brazil. Due to our previous experience, this facility, after commissioning, has processed 100 percent of the location's residue volume. We continue to study the feasibility to apply the technology for other refinery locations.





## IMPOUNDMENT MANAGEMENT FILTRATION PROCESS







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## RISK ASSESSMENT

All impoundment locations have monthly operational risk assessments, which requires reviewing potential consequences and mitigating controls. We also daily monitor for any significant change in conditions, such as variations in water storage capacity. If we identify any notable changes in water levels, we escalate the matter to technical experts, operating managers and, ultimately, the impoundment’s accountable executive to take action.

Each impoundment facility’s design, operation and closure plans identify mitigation and control measures to:

- Eliminate or avoid impoundment risks as much as possible;
- Reduce risk by minimizing the likelihood or potential consequence of an unwanted event or a specific condition that poses a risk, such as extreme weather events;
- Detect early, respond to and minimize the consequences of an unwanted event or condition using verified controls;
- Identify neighboring communities in flood-affected zones and societal issues (dust, noise, odor, etc.) and implement effective controls; and
- Develop detailed impoundment operational, maintenance and surveillance plans, and review and update them as needed throughout the facility’s life cycle.

## CLOSURE AND REHABILITATION

To minimize our impact on communities and the environment, we aim to progressively close and rehabilitate tailings and residue storage areas. For example, to reduce the risk of instability from continued water infiltration, we install an appropriate closure system (an impoundment cover, such as a liner or soil covered with grasses) and effectively manage alkaline water leachate and rainfall runoff post-closure. We also establish impoundment monitoring for many factors, including stability, consolidation and environmental performance. We have also performed field trials and fundamental research on tailings rehabilitation at many of our locations.

Part of the focus of our environmental performance monitoring and research is to better understand how the interactions between retained moisture and nutrient cycling in the cover layer can optimize the rehabilitation process, as well as develop new tailings area closure strategies.

Our current impoundment closure strategy incorporates long-term planning and includes the following main objectives:

- ✓ Aim for beneficial reuse of bauxite residue and mine tailings and/or eliminate the need for initial storage with process changes.
- ✓ Minimize impacts on the surrounding environment.
- ✓ Minimize potential leachate discharge and provide water treatment options.
- ✓ Ensure compatible land uses at closure, such as farmland and light industrial areas; and blend with the surrounding lands for aesthetics.
- ✓ Progressively implement impoundment closure actions, such as decharacterizing residue storage areas in Brazil, to reduce risks and not have the entire closure burden shifted to the end of operations.

## IMPOUNDMENT FACILITY INVENTORY

In accordance with the Mining and Tailing Safety Initiative and GISTM requirements, an inventory of our bauxite mine tailings and bauxite residue storage impoundment facilities are available publicly on our website.

We update and publish the database annually. The last update was in July 2022, with the next update scheduled for July 2023.

[Read more: Download Tailings Impoundment Database](#)





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# Biodiversity and Mine Rehabilitation

Alcoa is committed to protecting biodiversity at our sites by minimizing our environmental impacts and promoting sustainable land use. For new sites and major expansion projects, our goal is No Net Loss of biodiversity.



## CASE STUDY HIGHLIGHT

### Treat, Rehabilitate and Return

At our mine in Juruti, Brazil, we have an onsite 24-hour Wildlife Rehabilitation Center that treats and rehabilitates injured turtles, eagles, jaguars and other local wildlife. Read the full case study to learn more about this unique wildlife rehabilitation program.

[Read more: Treat, Rehabilitate and Return](#)





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## Biodiversity

Our commitment and approach to managing our biodiversity impacts and dependencies are detailed in our corporate Biodiversity Standard and reflected in our Biodiversity Policy.

[Read more: Biodiversity Policy](#)

We use the mitigation hierarchy to inform and guide our biodiversity management during the life cycle stages of our operations. As a result, we prioritize avoidance and minimization measures to mitigate unavoidable impacts. In areas disturbed by bauxite mining, a key measure to mitigate impacts is to progressively return the land to an agreed post-mining condition, including restoring native vegetation.

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

[Read more: World Heritage Sites and IUCN](#)

We conduct ongoing biodiversity surveys at existing operations to help understand the effectiveness of our management actions. For example, in 2022 while surveying at our Alumar site in Brazil, we identified more than 150 flora and fauna species, including more than 85 fauna species in a residue storage area closed 30 years ago and subsequently rehabilitated.



### ECOSYSTEM RESTORATION

Building on our biodiversity approach, in 2022 the Alcoa Foundation partnered with the IUCN to explore how ecosystem restoration projects can enhance biodiversity and generate community benefits in different environmental and social contexts. The joint project team is collaborating with the University of São Paulo and the University of Iceland to assess the success of restoration projects in different socio-ecological contexts. The collaboration intends to use the findings to create a model that can be applied in various countries to increase the effectiveness of restoration projects. The model will feature a viability assessment framework focused on restoration projects' social and economic outcomes. These valuable partnerships and projects promote meaningful, data-driven contributions to reducing our biodiversity impacts.

A 30-year-old rehabilitated residue storage area at Alumar is home to more than 85 fauna species.





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## Ecosystem Services

Ecosystem services are benefits obtained from natural ecosystems. They include goods such as food, timber or fresh water. They can also be in the form of erosion prevention, pollination and climate regulation, services including climate mitigation and erosion or disease control. Human activity can have significant effect on these benefits, thereby reinforcing the need for defined and sustainable control measures.

We began revising our Biodiversity Standard in 2022 to formally integrate our minimum expectations for managing impacts and dependencies on priority ecosystem services. We expect to complete the revision process in 2023 and progressively roll out the revised Standard to all locations through 2024.





In 2022, while conducting a survey in the Alumar port area in partnership with the Federal University of Maranhão and local communities, we identified important ecosystem services and more than 200 aquatic species. These included bioindicator species, a valuable natural barometer of an ecosystem's qualitative health.



## BIODIVERSITY ACTION PLANS

We have developed and implemented biodiversity action plans at all of our operating sites identified as adjacent to protected areas or within those of high biodiversity value. All our other operating locations (except a coal mine which temporarily reopened in 2022) also have biodiversity action plans in effect or in development.

### Biodiversity Action Plan

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





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### Operating Sites Within or Adjacent to Protected Areas or Areas of High Biodiversity Value

Operating Site and Location	Site Size	Position	Biodiversity Value
<b>Huntly and Willowdal bauxite mines</b> 📍 Jarrah Forest, Western Australia	712,900 hectares (1,761,614 acres)	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 (IUCN and federal government listed)
<b>Pinjarra alumina refinery</b> 📍 Pinjarra, Western Australia	6,088 hectares (15,044 acres)	Adjacent to areas of high biodiversity value	Ramsar listed wetlands adjacent; threatened species and ecological communities (IUCN and federal government listed)
<b>Wagerup alumina refinery</b> 📍 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 (IUCN and federal government listed)
<b>Portland aluminum smelter<sup>1</sup></b> 📍 Portland, Victoria, Australia	522 hectares (1,290 acres)	Adjacent to a protected area	Threatened species and ecological communities (IUCN and federal government listed)
<b>Juruti bauxite mine and related railroad and port facility</b> 📍 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 (IUCN listed)
<b>Poços de Caldas operations (bauxite mine and alumina refinery)</b> 📍 Poços de Caldas, Minas Gerais, Brazil	2,327 hectares (5,750 acres)	Within an area of biodiversity value	Fragmented native forests; threatened species (IUCN listed)
<b>Baie-Comeau aluminum smelter</b> 📍 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
<b>Lista aluminum smelter</b> 📍 Lista, Norway	248 hectares (613 acres)	Within the Lista Wetlands System, which is a network of Ramsar-listed reserves	Varied habitat types, including dunes, lakes and wetlands; rich bird diversity, including migratory species; conservation-significant plant species

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

<sup>1</sup> Area reported is the size of the land holdings or mining concession.





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## Mine Rehabilitation

Rehabilitation is a post-mining activity, but our planning begins during the early stages of a mine's development. To minimize our environmental footprint, we progressively rehabilitate disturbed areas during the mine's operational life.

One of the many strategies we use to optimize our rehabilitation efforts is preserving and re-spreading topsoil. We gauge the effectiveness of these efforts by using several criteria, including the total number of native plant species returned at some of our mines.

In 2022, we completed a review of the effects of our restoration techniques, including the methodology of topsoil handling, over the longer term at our bauxite mines in Western Australia. We found that collecting a thin surface layer of fresh topsoil and using it in rehabilitation can improve species richness and plant cover in the long term. The technique, called direct return, avoids the reduction of plant species returned that is caused by stockpiling soil or diluting it with subsoil.

At our Juruti mine in Brazil, we began a research project in partnership with the University of São Paulo. We are collaboratively reviewing the application of the mitigation hierarchy with University researchers and investigating ways to improve the monitoring of potential impacts on biodiversity and ecosystem services.



This comparison of two long-term trial sites at our bauxite mines in Western Australia's Jarrah Forest shows the effects of the direct return of topsoil after 45 years. The top site received double-stripped direct return topsoil, while the bottom site received topsoil stockpiled for two years before being re-used.





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## Mining and Rehabilitation Activity

In 2022, we had four active bauxite mining areas in Australia and Brazil and several inactive mines that are in the process of final rehabilitation and closure. A coal mine in Indiana, in the United States, also reopened and was active in 2022.

Our goal is to maintain a corporate-wide running five-year average ratio of 1:1 or better for active mining disturbance (excluding long-term infrastructure) to mine rehabilitation. This ratio indicates that the area of rehabilitation and disturbance is the same over a given period of time. We aim to use this ratio to manage the total open mine area over time.

The ratio for the 2018 to 2022 period for all of our mine assets was 0.82:1, which indicates that in this period there were more areas rehabilitated or transferred to other land users compared to new disturbed land for active mining.

### Mine Disturbance to Rehabilitation Target Ratio

Running five-year average

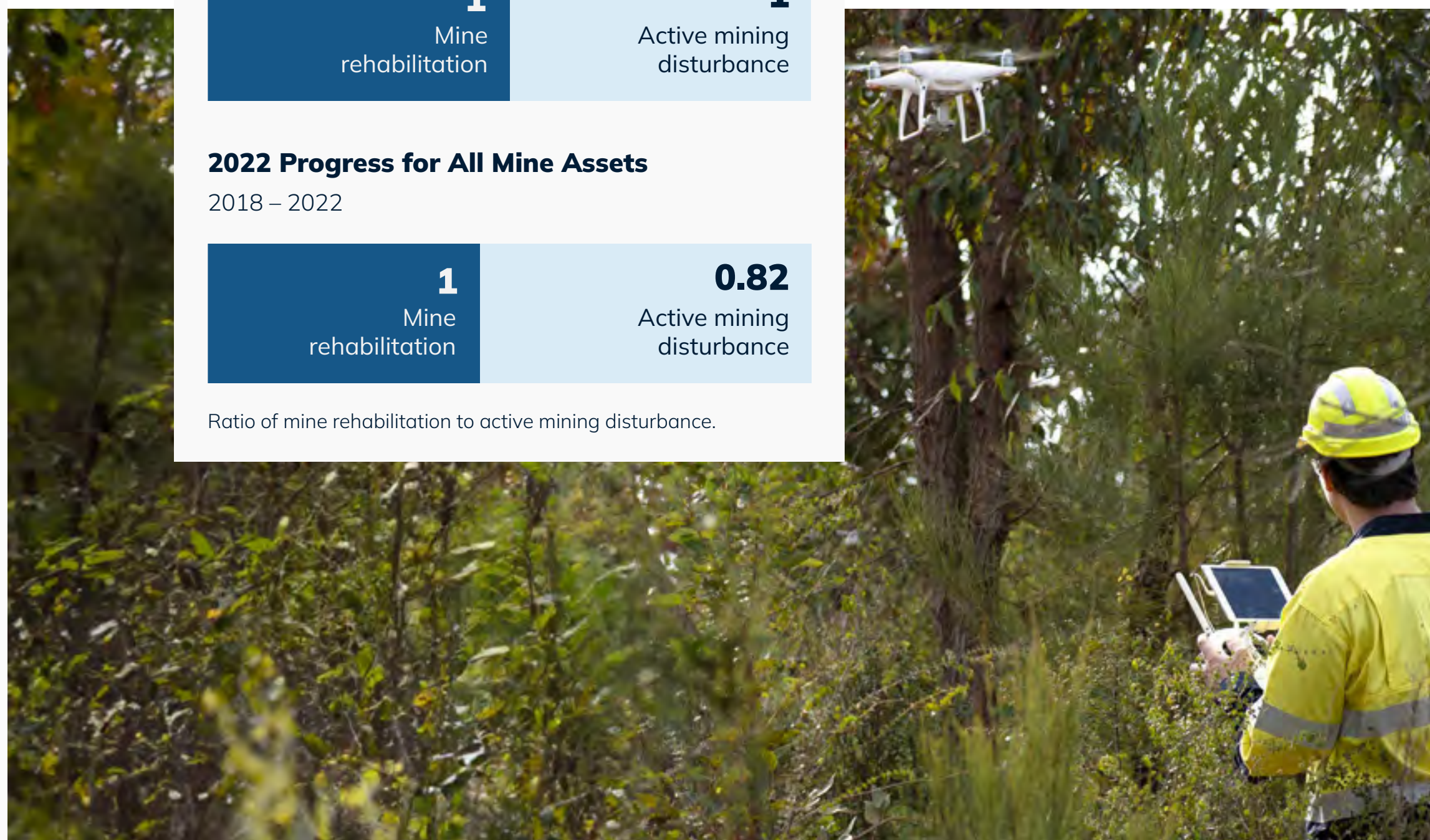


### 2022 Progress for All Mine Assets

2018 – 2022



Ratio of mine rehabilitation to active mining disturbance.



## Land Disturbance and Rehabilitation Areas 2018 – 2022

Hectares

### Annual Area of Disturbance

Year	Australia	North America	South America	Total
2018	675	48	520	1,243
2019	954	9	406	1,369
2020	822	0	532	1,354
2021	472	0	198	670
2022	378	16	658	1,052

### Annual Rehabilitation Area

Year	Australia	North America	South America	Total
2018	550	113	260	923
2019	665	83	392	1,140
2020	675	80	768	1,523
2021	614	13	287	914
2022	510	11	452	914

### Open Area

Year	Australia	North America	South America	Total
2018	5,739	1,003	9,027	15,769
2019	6,029	736	9,040	15,805
2020	6,176	656	8,804	15,636
2021	6,033	644	8,715	15,392
2022	5,901	648	8,921	15,470

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). Disturbance area means land disturbed in each reported year for mining or for mining infrastructure (such as roads, crushing equipment or conveyors). Rehabilitation area means land being returned to a native vegetation or to an agreed alternative use, such as farming or repurposing of mine infrastructure, after mining, in each reported year.





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## FEATURE STORY

# Protecting Ecosystems through Environmental Monitoring

Our Alcoa Fjarðaál smelting facility in Reyðarfjörður is located in a narrow fjord that is home to a diverse habitat in East Iceland. Preserving the area's flora and fauna has been one of our top priorities since the start of our facility's operations in 2007.

The Alcoa team, in partnership with the East Iceland Nature Research Centre (EINRC) and experts from Newcastle University and Cornell University, developed an extensive External Environmental Monitoring (EEM) program to detect any changes to the ecosystem.

The EEM program helps us assess the impact of the smelter's emissions. It measures air, soil and water quality. It also performs visual biodiversity assessments and livestock health surveillance.

The results are disclosed in Alcoa Fjarðaál's Sustainability and Green Accounting reports, which are submitted to the Environmental Agency of Iceland (EA) on a yearly basis. The reports are available to the public via the EA's website.

Due to its demonstrable effectiveness as a monitoring and engagement tool, the EEM program was shortlisted for a 2022 Alcoa EHS Excellence Award, an internal awards program that recognizes EHS best practices. Its lessons have already been shared

with smelters in other countries through the Ensuring Environmental Sustainability of Production of Primary Aluminium (ESPIAL) project. This project is carried out by the Aluminiumindustriens Miljøsekretariat (AMS), a consortium of four companies with operations in Iceland, Sweden and Norway. AMS aims to continuously improve environmental, health and safety conditions in and around aluminum plants through best practice sharing.





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# Water Stewardship

Water is one of the world’s most precious natural resources. Due to its valuable and often scarce nature—intensified by the growing impacts of climate change—water stewardship is one of the most important material issues for our Company and stakeholders.

Water is a key raw material within our operations, particularly for ore processing, cooling, casting, dust suppression and potable uses. To ensure we balance the needs of the communities and ecosystems, we work diligently to ensure our water use is responsible, efficient and safe. We strive to sustainably manage the water resources in and around our facilities and comply with all applicable environmental requirements in the countries where we operate. (See the [Reporting and Materiality](#) and [Sustainability Approach](#) sections.)





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

[Read more: Water Stewardship Policy and ICMM Position Statement on Water Stewardship](#)

In addition, we align our water disclosure and accounting with the ICMM Water Reporting Good Practice Guide, 2nd Edition. In 2022, we continued updating our water accounting processes to align with new ICMM reporting requirements, which come into effect for 2023 reporting. Certain changes in water withdrawal and outputs discussed below incorporate outcomes from the review of accounting methods.

Our Water and Wastewater Management Standard requires location-specific water management plans which consider a variety of issues including:

- Climate change and water stress;
- Current and alternative water sources;
- Water quality;
- Security of water supplies;
- Water reduction, substitution, reuse and recycling programs;
- Water resource contamination risks and mitigating actions, considering local context and receiving water bodies;
- Other water impacts, such as erosion, acidification and salinization.

Our location-specific water management plans include action plans for higher-risk aspects, which we review at least every five years. In 2022, we launched water projects for improved monitoring and metering, discharge management and water use reduction.

As part of our long-term planning process, our operations must maintain water-use forecasts, considering relevant risks and opportunities. Similarly, our Global Capital Management System evaluates water consumption impacts, including quantity and quality for proposed capital projects.

We began reviewing our water stress assessment in 2022 and plan to complete catchment and operational water risk assessments in 2023, reviewing physical, regulatory and reputational risks supported by the World Wildlife Fund Water Risk Filter Tool. This work is a continuation and expansion of the water scarcity review we completed using the World Resource Institute Aqueduct tool and local assessment in 2018.

The 2018 assessment focused on water scarcity and identified six facilities that met our definition of water-scarce locations, these were 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. All our other facilities were classified as low-to-medium or low baseline water stress.

**Water and Wastewater Standard Requirements**

- ✓ Location-specific water management and action plans
- ✓ Documented water balance for each location that is reviewed and updated at least every five years
- ✓ Risk-based monitoring program
- ✓ Access to safe, high-quality potable water
- ✓ Wastewater treatment facilities operated and maintained in accordance with permit conditions and standard industry practices
- ✓ In greenfield expansions where no local discharge requirements exist, senior leadership must adopt and approve limits and thresholds that are consistent with international standards, ensuring protection of the surrounding community and environment





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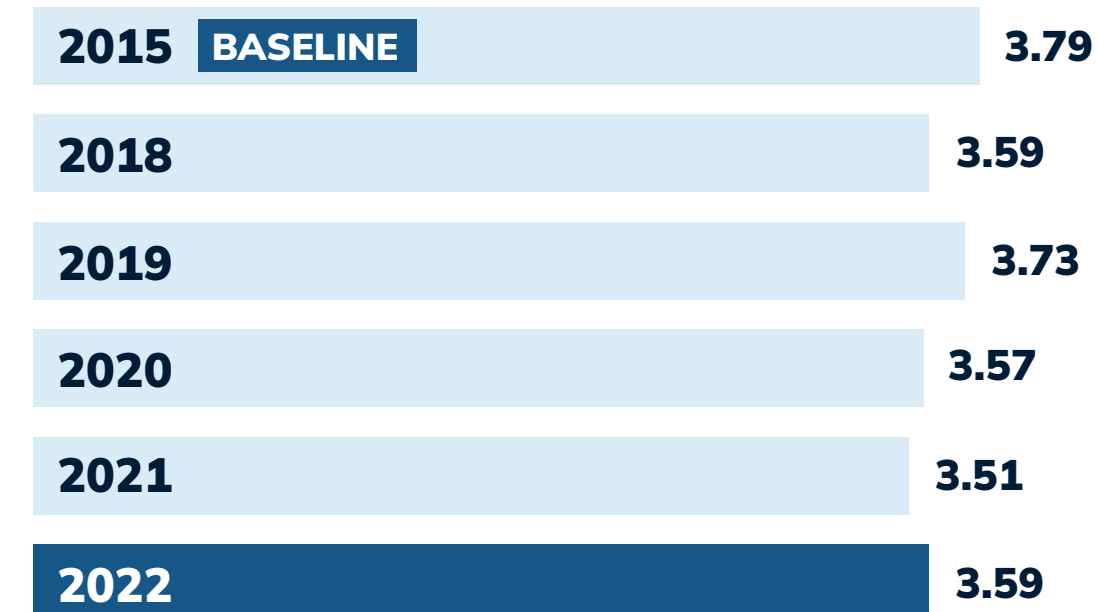
During 2022, we reassessed the Alumar location utilizing the 2018 methodology due to the restart of the Alumar Smelter. As part of this review, we updated the local assessment and identified that the facility no longer meets the definition of an Alcoa-defined water-scarce location. As a result of this update, we now identify 23 percent of our locations as meeting our definition of water-scarce locations. These are the five facilities in Western Australia: the Huntly and Willowdale bauxite mines and the Kwinana, Pinjarra and Wagerup alumina refineries.

Recognizing that water scarcity continues to be a significant risk for our facilities in Western Australia, our long-term goal remains 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, using a 2015 baseline. The baseline has been updated to reflect the remaining five locations.

In 2022, we reported a 5.3 percent reduction against the baseline and a 2.3 percent increase from the previous year. This annual increase is primarily due to lower production at the Pinjarra and Kwinana refineries. Factors such as bauxite quality influence the amount of water required to produce alumina.

**Total Water-Use Intensity in Alcoa-Defined Water Scarce Locations**

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 operational water inputs together with any change in storage to accurately reflect years when water is used within our process. **The baseline and intensity values have been adjusted to reflect the removal of Alumar Refinery from the definition of an Alcoa-defined water-scarce location.**

To better understand future water supply options, we partnered with industry peers to complete a water supply study in 2022 in the water-scarce southwest region of Western Australia. The outcomes of this initial study identified future water supply impacts and opportunities, with a focus on recognizing and supporting local, cultural and ecological values. We will use these findings to shape our future water supply strategies for our facilities within the region.

All our locations, including those in water-rich areas, look for ways to reduce consumption and discharge, use fit-for-purpose water sources, and increase recycling and reuse opportunities through advanced technologies and process improvements.

Our focus on water stewardship also extends beyond our operations. For example, within host communities, our site teams and employees actively engage with government agencies and non-governmental organizations focused on water quality and conservation, such as Le Comité ZIP de la Rive Nord de l'Estuaire (Coastal protection and conservation) and L'Organisme de Bassin Versant Manicouagan (OBV, Inland watershed system) in Baie-Comeau. The Alcoa Foundation also provides financial support for various water-based community initiatives.

[Read more: Alcoa Foundation Initiatives](#)

Within our supply chain, we assess suppliers against water management criteria as part of our Global Supplier Sustainability Program and Supplier Standards. (See the [Supply Chain Management](#) section.)

All water discharges are managed in accordance with location standards and regulatory requirements. In 2022, we had six non-compliances associated with water-quality permits, standards and regulations that resulted in formal enforcement actions. (See the [Compliance](#) section.)





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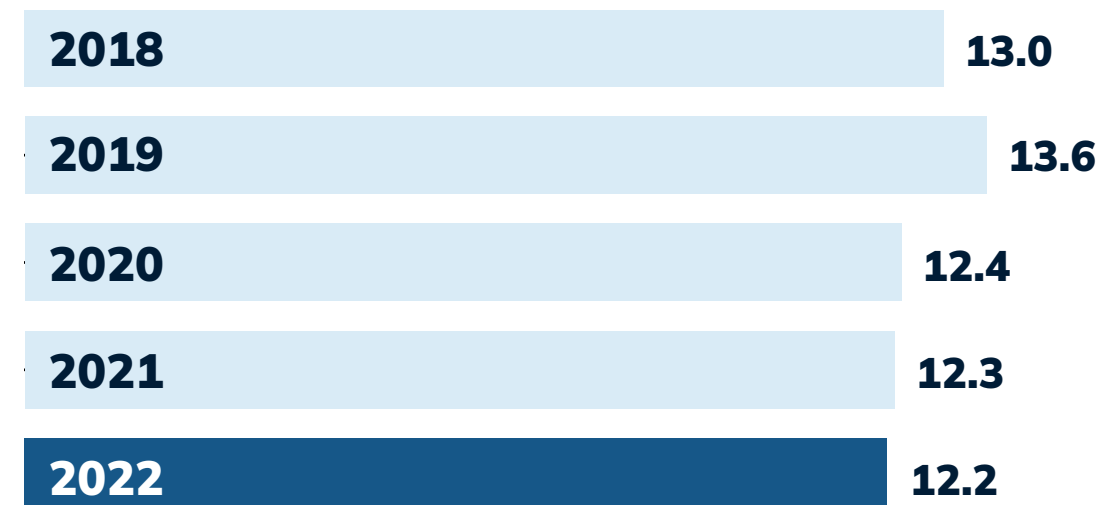
## Water Use

The availability and inherent value of water can vary significantly around the world. For example, in some countries, such as Canada, Iceland, Norway and parts of the United States, water can be plentiful and provide power to our smelters via hydroelectric dams. In other regions, water resources can be limited and water availability far less predictable, such as the dry climate of Western Australia and the high seasonal variation of rainfall in Brazil. To maintain sustainable water access in our host communities, we promote ongoing dialogue and use science-based approaches to enhance our water management in each area.

For example, in regions where water is scarce, our locations recycle and reuse water multiple times before it is lost to evaporation or entrainment, with minimal discharges at these sites. At other facilities, including our Warrick power station in the United States and our smelters in Norway, we discharge most of the water that we withdraw for non-contact cooling, by returning it to the same source.

### Freshwater Use Intensity – Operational Plants

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).

The largest users of water within our operations are our power stations, refineries and casthouses. At 88.0 percent of total water withdrawn in 2022, surface water is our highest-volume withdrawal. It is also our highest-volume discharge at 85.8 percent of total water discharged. Our main forms of water consumption are evaporation from tanks, vents and storage, entrainment in bauxite mine tailings and uses within our casting locations.

We used a total of 834.9 million cubic meters of water in 2022, remaining stable compared to 2021. Our water withdrawal decreased 0.7 percent over the prior year to 834.6 million cubic meters, and we recycled or reused 145.0 million cubic meters of water. Our total outputs (discharge and consumption) increased by 0.2 percent. Water discharges decreased by 0.9 percent to 771.2 million cubic meters and water consumption increased by 15.1 percent to 64.9 million cubic meters.

Our Warrick Smelter reported a 3.1 percent decrease in cooling water use with a reduction in pumping capacity due to pump maintenance contributing to this decrease. Total water use remained stable in 2022 because this decrease was primarily offset by additional operational water sources identified during the review of our water accounts.

The review of our water accounting to align with the ICMM Water Reporting Good Practice Guide, 2<sup>nd</sup> Edition was completed in 2022. During this review, we identified an additional 18 million cubic meters of operational water sources that required inclusion in the operational water account.

Below is a breakdown of the additional water sources:

- 4.5 million cubic meters were attributed to non-contact cooling water at our Lista smelter and rainfall runoff entering mixed water stores prior to discharge at our Portland and Baie Comeau smelters, and San Ciprián refinery; and
- The remaining 13.5 million cubic meters was identified from water entering our tailings ponds at our Juruti mine facility. The significant surface area of the facility’s tailings ponds, coupled with Amazonian rainfall levels that were not previously captured in the water account, contributed to the increase.

In addition to the 13.5 million cubic meters identified at Juruti during the water account review, this facility also had an increase in freshwater use due to reduced rainfall and greater entrainment of water in tailings due to increased dredging operations. Total water use and subsequent water discharge and consumption increased at Juruti by approximately 16 million cubic meters in total in 2022.

Our Alcoa-defined water-scarce locations used 32.6 million cubic meters of water in 2022, which was a 4.0 percent decrease compared to 2021 and accounted for 3.9 percent of our total water use. These locations recycled or reused 114.6 million cubic meters of water during the year. Their high-quality water withdrawal as a percentage of total high-quality water withdrawn was 2.3 percent, with high-quality water consumption as a percentage of total high-quality water consumption at 28.5 percent.





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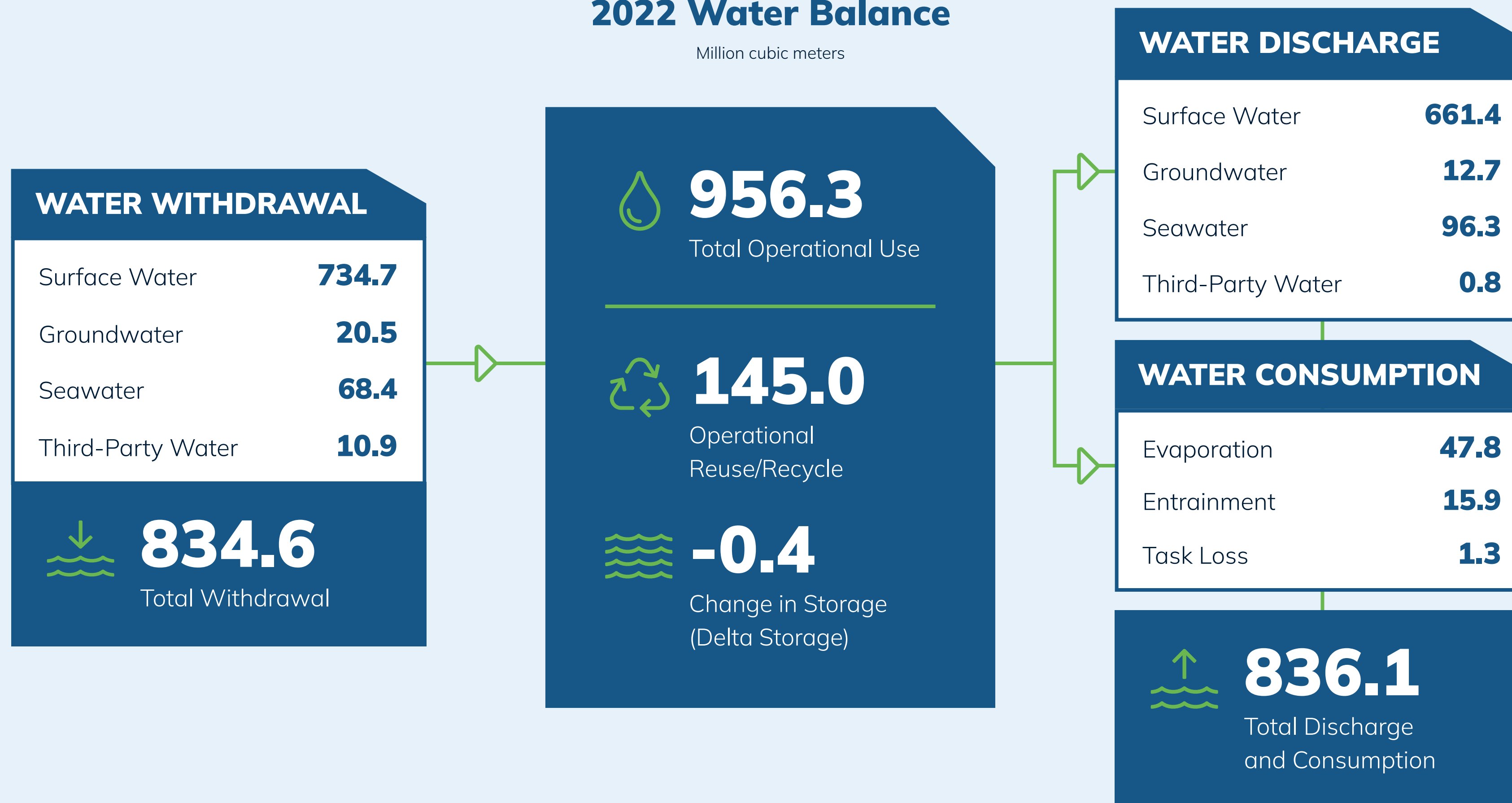
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## 2022 Water Balance

Million cubic meters







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## 2022 Water Balance – All Sites

Million cubic meters

Metric	Source/Destination/Type	Volume of Water by Quality			Total
		Category 1	Category 2	Category 3	
Operational Water Withdrawal (Inputs)	Surface Water	43.3	673	18.4	734.7
	Groundwater	4.6	11.7	4.2	20.5
	Seawater	0	0	68.4	68.4
	Third-Party Water	2.9	6.7	1.3	10.9
	<b>Total Withdrawal</b>	<b>50.8</b>	<b>691.4</b>	<b>92.4</b>	<b>834.6</b>
Operational Water Discharge (Outputs)	Surface Water	2.9	657.9	0.6	661.4
	Groundwater	0	1.3	11.4	12.7
	Seawater	0	2.9	93.4	96.3
	Supply to Third Party	0.1	0	0.7	0.8
	<b>Total Discharge</b>	<b>3</b>	<b>662.1</b>	<b>106.1</b>	<b>771.2</b>
Operational Water Consumption (Outputs)	Evaporation	5.9	13.1	28.8	47.8
	Entrainment	0	0.7	15.1	15.9
	Task Loss	0	1.3	0	1.3
	<b>Total Consumption</b>	<b>5.9</b>	<b>15.1</b>	<b>43.9</b>	<b>64.9</b>
<b>Total Outputs (Discharge &amp; Consumption)</b>		<b>8.8</b>	<b>677.2</b>	<b>150.1</b>	<b>836.1</b>
<b>Operational Water Reuse/Recycle</b>					<b>145.0</b>
<b>Operational Water Use</b>					<b>956.3</b>
<b>Change in Storage (Delta Storage)</b>					<b>-0.39</b>

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 2022, high-quality water withdrawals were 53.03 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.





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## 2022 Water Balance – Alcoa-Defined Water-Scarce Locations

Million cubic meters

Metric	Source/Destination/Type	Volume of Water by Quality			Total
		Category 1	Category 2	Category 3	
<b>Operational Water Withdrawal (Inputs)</b>	Surface Water	4.7	0.6	12.2	17.4
	Groundwater	0	7.8	2.0	9.8
	Seawater	0	0	0	0
	Third-Party Water	1.3	2.7	1.0	5.1
	<b>Total Withdrawal</b>	<b>6.0</b>	<b>11.1</b>	<b>15.1</b>	<b>32.2</b>
<b>Operational Water Discharge (Outputs)</b>	Surface Water	0.7	0	0	0.7
	Groundwater	0	0	0.2	0.2
	Seawater	0	0	0	0
	Supply to Third Party	0	0	0	0
	<b>Total Discharge</b>	<b>0.7</b>	<b>0</b>	<b>0.2</b>	<b>0.9</b>
<b>Operational Water Consumption (Outputs)</b>	Evaporation	5.3	0.7	18.2	24.2
	Entrainment	0	0	8.9	8.9
	Task Loss	0	0	0	0
	<b>Total Consumption</b>	<b>5.3</b>	<b>0.7</b>	<b>27.1</b>	<b>33.1</b>
<b>Total Outputs (Discharge &amp; Consumption)</b>		<b>6.0</b>	<b>0.7</b>	<b>27.3</b>	<b>34.0</b>
<b>Operational Water Reuse/Recycle</b>					<b>114.6</b>
<b>Operational Water Use</b>					<b>146.8</b>
<b>Change in Storage (Delta Storage)</b>					<b>-0.4</b>

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 2022, high-quality water withdrawals were 53.03 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.





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# Air Emissions

We work to reduce air emissions and their associated impacts by continually improving our operational stability and utilizing add-on technologies where applicable. Our global standard defines the minimum requirements to ensure emissions and air quality impacts are managed in a manner that demonstrates compliance and addresses potentially adverse impacts on the environment and community.

We manage our non-GHG air emissions—such as sulfur dioxide, particulates and fluoride—using strict internal standards and conforming with applicable air emission regulations in the jurisdictions where we operate.





# Global Emissions

The following data covers air emissions across our global operations. At the local level, we quantify and report carbon monoxide, particulate matter and other emissions resulting from specific processes. Lead is not added as a raw material in our processes but may be present in incidental trace amounts in naturally derived raw materials, such as calcined petroleum coke and alumina. Emitted quantities are minimal and immaterial but may be subject to reporting based on locally applicable requirements.

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## Mercury Emissions Intensity

Grams per thousand metric tons of alumina produced

<b>2018</b>	<b>0.15</b>
<b>2019</b>	<b>0.13</b>
<b>2020</b>	<b>0.12</b>
<b>2021</b>	<b>0.12</b>
<b>2022</b>	<b>0.12</b>

## Mercury Emissions

Thousands of kilograms

<b>2018</b>	<b>2.1</b>
<b>2019</b>	<b>1.9</b>
<b>2020</b>	<b>1.9</b>
<b>2021</b>	<b>1.8</b>
<b>2022</b>	<b>1.7</b>

## Fluoride Emissions Intensity

Kilograms per metric ton of primary aluminum produced

<b>2018</b>	<b>0.46</b>
<b>2019</b>	<b>0.50</b>
<b>2020</b>	<b>0.56</b>
<b>2021</b>	<b>0.53</b>
<b>2022</b>	<b>0.57</b>

The increase in 2022 is due to instability related impacts from curtailments and re-starts at the Warrick, Sao Luis, and Portland smelters.

## Nitrogen Oxide Emissions

Thousands of metric tons

<b>2018</b>	<b>19.1</b>
<b>2019</b>	<b>20.3</b>
<b>2020</b>	<b>21.9</b>
<b>2021</b>	<b>20.4</b>
<b>2022</b>	<b>19.2</b>

## Sulfur Dioxide Emissions

Thousands of metric tons

<b>2018</b>	<b>46.9</b>
<b>2019</b>	<b>44.9</b>
<b>2020</b>	<b>50.3</b>
<b>2021</b>	<b>47.8</b>
<b>2022</b>	<b>43.8</b>

## Volatile Organic Compounds Emissions

Metric tons (refining operations only)

<b>2018</b>	<b>285.6</b>
<b>2019</b>	<b>288.7</b>
<b>2020</b>	<b>293.0</b>
<b>2021</b>	<b>287.8</b>
<b>2022</b>	<b>295.9</b>

The increase in 2022 was due to increased production at several locations.





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# Circular Economy and Waste Management

As part of our commitment to sustainability, we embrace circular economy principles by working within our business and supply chain to support the transition from a linear economy.

Concretely, these principles place importance on reducing or eliminating waste and pollution, using resources as long as possible and supporting the regeneration of natural and social systems. For information on how these principles are applied to other work areas, see the [Local Commitment with Communities](#), [Supply Chain Management](#), and [Biodiversity and Mine Rehabilitation](#) sections.





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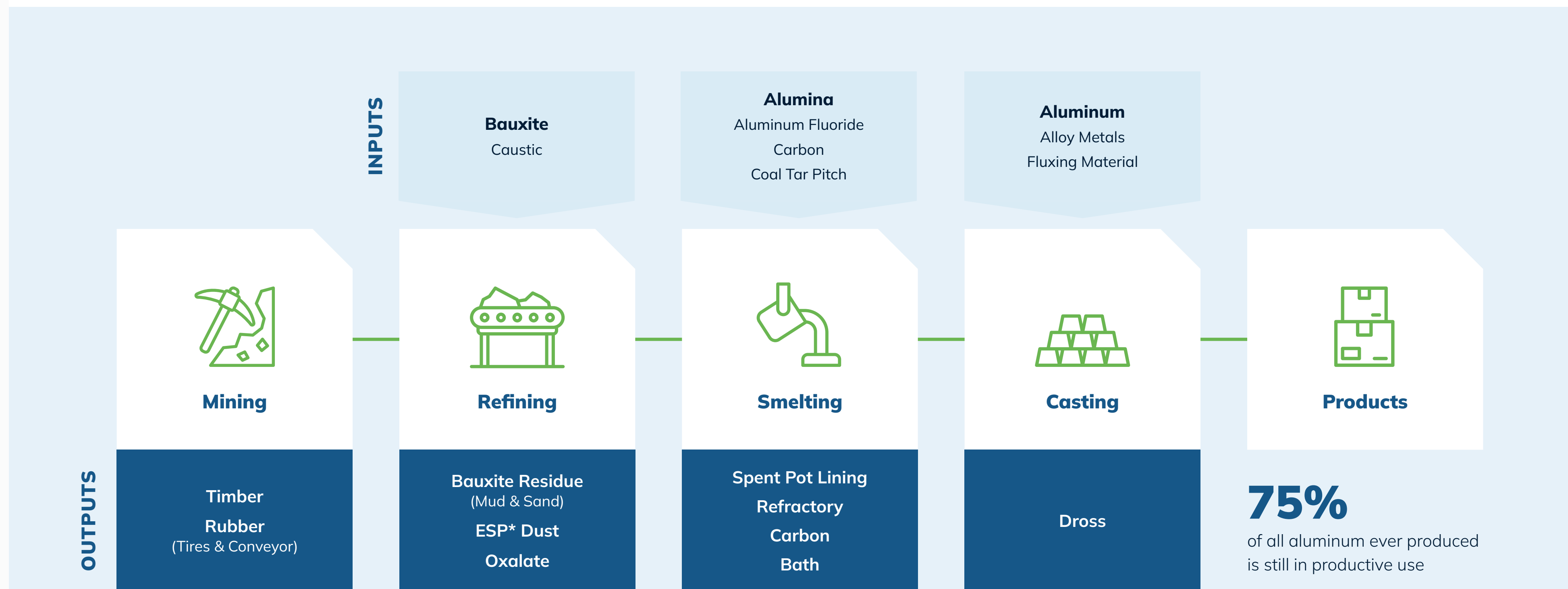
## Circular Economy

From raw material extraction, to manufacturing, to product end of life, Alcoa aims to continuously improve circularity in our value chain. By reintroducing spent materials back into our processes and improving the recyclability of our products, we can divert materials from landfills and reduce our GHG emissions, all while improving efficiencies.

## Materials Generated Across Our Value Chain

In line with our commitment, we launched a circular economy program in 2022, at our Pinjarra and Wagerup refineries in Western Australia. As part of the program, we completed detailed life cycle and material flow analyses to expand our understanding of our refineries' upstream and downstream materials, and identify new ways to enhance circular economy in our operations. The program analyzed key material inputs, including raw materials, process chemicals, packaging, personal protective equipment and office stationery, and integrated the principles of circular economy to yield actionable recommendations.

While this circularity program focused on two refineries, we are looking to integrate many of its processes and outcomes globally as part of our ongoing work, with key focus areas on material management, packaging, procurement and governance initiatives. We are also collaborating with other industry partners to identify and explore broader opportunities in Western Australia.



\*Electrostatic Precipitator





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## Waste Optimization Program

Our waste optimization program focuses on 10 material types across 17 locations to help achieve our waste reduction goals. This circularity-focused program uses the waste minimization hierarchy to align and optimize our efforts. Although our global operations often share opportunities to minimize, reuse and repurpose waste, site-level success generally involves a tailored approach that leverages global learnings.

For example, in 2022, we validated a method to repurpose timber waste in Western Australia. This is waste that is left over after higher-value materials, such as logs, are recovered from mine sites. Thanks to our new repurposing method, we will be able to turn this waste into wood chips and organic mulches starting in 2023.

Another material that we look to repurpose is spent carbon materials. We secured contracts to recover 1,700 metric tons of spent carbon materials at our San Ciprián smelter in Spain for various uses including as an energy source for steel manufacturing. Our Alumar smelter in Brazil also sold over 85 metric tons of by-products to four cement industry customers.

To amplify our efforts, we also collaborate with other entities, such as Tyre Stewardship Australia (TSA). During 2022, we worked with TSA on an initiative focused on recovery of off-the-road (OTR) tires. The trial focused on the handling and logistics to convert used mining tires into rubber crumb and steel. We contributed 20 metric tons of OTR tires to the program. And we are not stopping there. In line with our commitment to find innovative local solutions for rubber recycling, we signed a letter of support stating our intention to supply feedstock to an emerging rubber recycling technology for our Western Australian operations.

Building on these successes, we are fostering relationships and developing opportunities to expand these initiatives to all our operations and material types.

### Waste Minimization Hierarchy

**MOST PREFERRED**



#### 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.



#### Reuse

Reuse the waste or industrial byproduct onsite or offsite for its original purpose or another beneficial purpose



#### Recycling/Composting

Recover value and resources from wastes



**LEAST PREFERRED**

#### Treatment/Disposal

Reduce the volume, toxicity or other hazardous characteristics of waste prior to disposal or discharge





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## SECONDARY MINERALS SOLD IN 2022

Brazil

**198,485**

metric tons

Canada

**83,154**

metric tons

Europe

**29,030**

metric tons



**310,699**

total volume sold (metric tons)



**\$18,265,794**

total sales (US\$)

## Secondary Minerals and Materials

Our Secondary Minerals team is responsible for finding alternative uses and markets for our secondary minerals and materials. In addition to reducing landfilled waste, these efforts can lower our operating costs and create additional revenue streams.

The secondary minerals and materials we currently sell include carbon, electrolytic bath, fly ash, used refractories and secondary aluminas. These materials are reutilized in the production of steel, cement and refractory ceramics, among others.

### Secondary Materials Classification 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.

### Disposal

Materials that are typically landfilled or otherwise disposed.





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## Aluminum Recycling

Although we are a primary aluminum producer, some of our casthouses use recycled aluminum. In 2022, most of these inputs were processed in Mosjøen in Norway, Poços de Caldas in Brazil and San Ciprián in Spain.

We produce our EcoDura™ high-quality aluminum with pre-consumer recycled content, conserving significant amounts of energy and reducing the environmental impacts associated with primary aluminum extraction and refining. The product supports our shift in moving toward a circular economy and the growing demand for sustainable building initiatives, including proof of Leadership in Energy & Environmental Design (LEED) certification.

[Read more: LEED certification](#)

Currently, there is no technology available to process post-consumer scrap into a quality comparable with primary aluminum. To address this gap, we are developing our ASTRAEA™ research and development project—a metal purification process that can extract aluminum from common scrap materials and refine it to purity levels far exceeding what is produced from most commercial smelters.

By separating aluminum from non-ferrous alloys through a highly efficient and effective process, ASTRAEA™ has the potential to turn millions of tons of scrap waste into high purity aluminum, which can be used as a raw material for any number of applications, including electrical vehicles (EV). It may also enable the use of post-consumer scrap in the aerospace and defense industries. (See the [Technology and Innovation](#) section.)



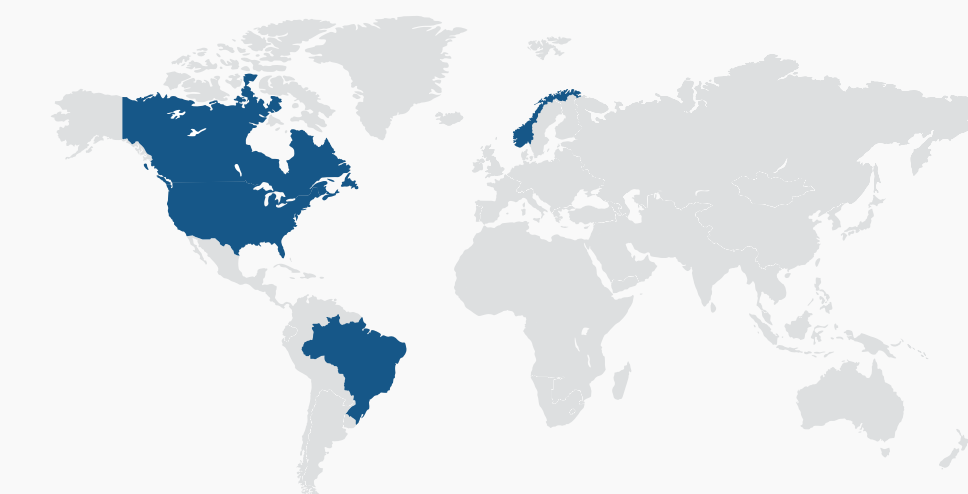
### Average Recycled Content in Aluminum

Percent



Source: IAI, 2021

### EcoDura™ Availability



According to the IAI, the aluminum industry needs to **increase post-consumer scrap recycling by 55 percent** over 2018 levels by 2023, as one element of decreasing the industry's overall emissions by 75 percent to meet IPCC-recommended climate targets.





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## Spent Pot Lining

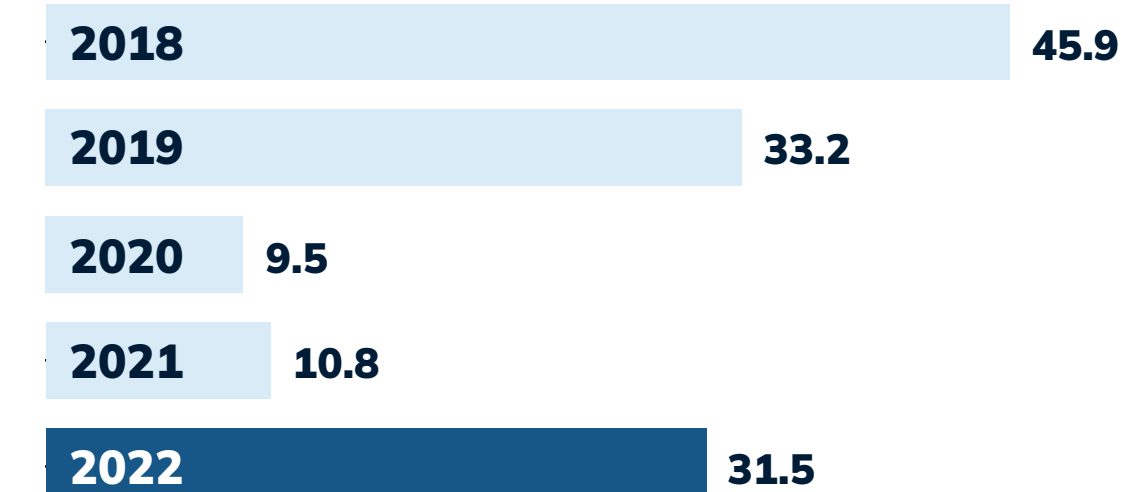
A common material generated in the smelting process, spent pot lining (SPL) is carbon and refractory lining material that is generated during the ongoing re-lining of our smelting pots. While the total amount of SPL generated by our smelters each year is impacted by the number of pots in operation and their longevity, the amount of material generated can be considerable. To minimize the potential impacts of this material, we recycle or treat it prior to disposal in accordance with applicable country-specific regulations.

To reduce the amount of SPL we generate, we focus on getting the most possible use out of the pot lining and finding alternative approaches to relining.

Our SPL Global Lead Team also explores ways to transform SPL into raw materials or fuel sources for other industries, such as the cement and steel industries. In 2022, our smelters in Iceland and Norway explored regional SPL recycling partnerships and participated in recycling trials in mainland Europe. In addition, our North American facilities participated in trials to send SPL directly to authorized cement kilns and other recyclers. In 2022 we increased our SPL recovery rate, with 31.5 percent of SPL generated being recovered. Our facility in Portland, Australia, contributed to this improvement, recovering 13,754 metric tons in 2022, and removing material from storage.

### Spent Pot Lining Recovered

Percent of SPL generated that was diverted for recycling, preparation for reuse, or other recovery option



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.







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## Bauxite Residue

Bauxite residue is a byproduct of the alumina refining process. In 2022, we generated 23.0 million metric tons of the material, and we are collaborating with external organizations and universities to develop opportunities to reuse residue. The amount of residue per metric ton of alumina produced slightly increased in 2022 due to reduced bauxite grade. (See the [Impoundment Management](#) section.)

Our ongoing initiatives include:

- ✓ **The ReActiv project**, which aims to transform bauxite residue into a reactive material that is suitable for low-carbon cement products.
- ✓ **A collaboration with the University of São Paulo** to unlock the potential for large-scale use of untreated bauxite residue in global cement production.
- ✓ **An IAI collaboration** to identify potential pathways to adopt bauxite residue in cement production and use. Our focus in 2022 was to understand the requirements for classifying bauxite residue to provide globally accepted guidance for ensuring its safe transportation.
- ✓ **A second IAI project** focused on rapidly transforming in-situ bauxite residue into a soil-like medium. We continued evaluating trial plots at our Kwinana refinery in Western Australia in 2022.

We are also exploring secondary use opportunities for coarse sand and clay components of bauxite residue in construction, agriculture and the development of decarbonization products.



### CASE STUDY HIGHLIGHT

## Partnership Turns Waste into Low-Carbon Cement

Circularity in Action: Read the full case study to see how a partnership with the University of São Paulo in Brazil has enabled Alcoa to transform bauxite residue into low-carbon cement.

Read more: [Partnership Turns Waste into Low-Carbon Cement](#)

### Bauxite Residue Intensity

Metric tons of residue per metric ton of alumina produced

2018	1.56
2019	1.55
2020	1.54
2021	1.58
2022	1.61

2018, 2019 & 2020 data updated post data correction.

## BAUXITE RESIDUE REUSE OPPORTUNITIES

### Western Australia

- Top dressing
- Fill for industrial land development
- Road construction
- Nutrient management
- Soil amendments and conditioners
- Clinker/cement/concrete manufacture
- Brick manufacture
- Rare earth and mineral extraction
- Geopolymers

### United States

- Acid mine drainage
- Wastewater treatment (artificial wetlands)
- Levee construction
- Rare earth and critical mineral extraction

### Brazil

- Clinker/cement/concrete manufacture
- Brick manufacture
- Rare earth and critical mineral extraction

### Spain

- Clinker/cement manufacture
- Rare earth and critical mineral extraction





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# Waste Management

Our circular approach to waste management means we look beyond traditional linear economy practices and embrace opportunities to reduce, reuse and repurpose waste by utilizing the waste minimization hierarchy. This methodology helps lessen the negative impacts of landfilling, such as land use, emissions, and soil and groundwater contamination. It also conserves natural resources and supports the growth of material recovery economies. Underpinning this approach is our Waste Management Standard which 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
- ✓ Tracking of non-hazardous and hazardous waste metrics

Our sites report their waste metrics into our centralized corporate environmental metrics database, which we updated in 2022 to include Incineration (with and without energy recovery) and Other Disposal Operations.

Each site's waste management plan must include waste minimization strategies that support our sustainability goals. These plans, which are reviewed at least every three years, are developed with input from various divisions, including operations, maintenance and procurement.

To promote a consistent approach throughout our value chain, we assess supplier waste generation as part of our global Supplier Sustainability Program and Supplier Standards. (See the [Supply Chain Management](#) section.) We also have a comprehensive assessment process for waste transporters and facilities that receive industrial waste or by-products from our facilities. These assessments are completed in accordance with our internal standard to confirm that our waste is also managed responsibly by these third parties.

Our long-term waste goal is a 15 percent reduction in landfilled waste by 2025 and 25 percent by 2030 from a 2015 baseline. Our goal focuses on landfilled waste to emphasize reduction at the source and to move from landfill disposal to recovery, including reuse and recycling.

In 2022, we achieved a 37.6 percent reduction in landfilled waste from the baseline and 2.5 percent reduction from the prior year. Factors behind this performance include a reduction in SPL and dross residual disposal to landfill. It should be noted that we exclude mineral wastes from our waste generation, disposal and recovery data. These include bauxite residue, refining process waste, fly ash and certain other waste streams. We manage these materials separately with onsite storage or impoundment areas. Overburden and rock generated from our mining activities are also not included in this data; these materials are returned for reuse during mine rehabilitation.

## 2022 Waste Type and Management Method

Thousands of metric tons

Management Method	Hazardous Waste	Non-Hazardous Waste	Total
<b>Generated</b>	112.2	160.6	<b>272.8</b>
<b>Preparation for Reuse</b>	0.02	0.02	<b>0.04</b>
<b>Recycling</b>	59.4	119.90	<b>179.3</b>
<b>Other Recovery Operations</b>	0.1	1.9	<b>2.0</b>
<b>Incineration</b> (With Energy Recovery)	1.4	1.9	<b>3.3</b>
<b>Incineration</b> (Without Energy Recovery)	0.4	0.4	<b>0.8</b>
<b>Landfilling</b>	50.3	31.8	<b>82.2</b>
<b>Other Disposal Operations</b>	0.2	3.0	<b>3.2</b>

Non-mineral wastes





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### Landfilled Waste

Thousands of metric tons

<b>2015</b>	<b>BASELINE</b>	<b>131.7</b>
<b>2019</b>		<b>107.6</b>
<b>2020</b>		<b>99.6</b>
<b>2021</b>		<b>84.3</b>
<b>2022</b>		<b>82.2</b>

Non-mineral wastes

### Total Waste Recovered

Thousands of metric tons recovered through recycling, preparation for reuse, or other recovery options

<b>2018</b>		<b>180.1</b>
<b>2019</b>		<b>186.4</b>
<b>2020</b>		<b>186.9</b>
<b>2021</b>		<b>171.2</b>
<b>2022</b>		<b>181.4</b>

Non-mineral wastes





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## Transformation Waste

We also track and report waste generated from our Transformation Group, which manages all our closed or curtailed operations. Since closure activities are non-recurring and episodic in nature, it is not appropriate to compare waste trends between our operations and our closed and curtailed locations. Hence, this data is captured separately. (See the [Facility Stewardship and Transformation](#) section.)

### Transformation Waste

Thousands of metric tons

Year	Landfilled Waste	Waste Recovered Recycling, Preparation for Reuse & other Recovery Operations
2019	32.8	8.6
2020	71.9	28.5
2021	18.5	15.9
2022	39.9	7.6

## Spill Management

To prevent and manage spills, we have mitigation measures in place to handle exposure risks associated with a variety of materials. These measures include:

- ✓ Secondary containment
- ✓ Inspection practices
- ✓ Work practices during loading/unloading operations
- ✓ Technology-based leak detection systems on critical piping and tank systems

We also have emergency response plans in place to protect people and the environment in the event of a spill. All locations are required to implement and maintain written emergency response plans, and have personnel trained to prevent and respond to potential emergencies. To maintain their level of readiness, all emergency personnel must perform annual emergency preparedness drills.

Our internal incident and reporting standard requires us to report all spills greater than 20 liters (5.3 gallons) outside a containment area. This reporting is done even if there are no external reporting requirements. We review and analyze these events based on several factors, including volume, type of material released and the area impacted. For high-priority events, we perform an investigation and root cause analysis to generate corrective actions to prevent recurrence.

We define a major spill as one that has a significant and potentially lasting impact on sensitive ecosystems or communities, or with the potential to endanger our operating license. In 2022, we had zero major spills.





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# Disclosures & References

At Alcoa, transparency is not just a catchphrase. We report on metrics material to our organization in line with international standards, including GRI, SASB and ICMM. We are also committed to painting a complete picture by providing additional data and references when available.





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**Appendix A**

# Content Index

This index helps readers compare the information from our sustainability report, annual report and website with the GRI Standards, SASB Standards, UN SDGs and the ICMM 10 Principles.

This report has been prepared in accordance with the GRI Standards 2022.

**General Disclosures**

GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle	ASI Requirement	Note
<b>GRI 2: General Disclosures 2021</b>							
2-1	Organizational details	<a href="#">Corporate Overview</a>	EM-MM-510a.2				
2-2	Entities included in the organization's sustainability reporting	<a href="#">About this Report, Corporate Overview, Reporting and Materiality, Annual Report</a>					
2-3	Reporting period, frequency and contact point	<a href="#">About this Report</a>					Contact point: Rosa García Piñeiro – Vice President, Sustainability
2-4	Restatements of information	Changes in reporting from prior year are indicated throughout the report					
2-5	External assurance	<a href="#">About this Report, ESG Transparency and Disclosure, ERM CVS Limited Assurance Statement</a>			Assurance and validation		
2-6	Activities, value chain and other business relationships	<a href="#">Corporate Overview, Products, Supply Chain Management, Annual Report, Quarterly Reports, News Releases</a>	EM-MM-000.A EM-MM-000.B	8, 12	10		
2-7	Employees	<a href="#">Inclusion, Diversity and Equity, Talent Attraction, Retention and Development</a>	EM-MM-000.B	5, 8, 10			
2-8	Workers who are not employees	<a href="#">Supply Chain Management, Safety and Health</a>	EM-MM-000.B				
2-9	Governance structure and composition	<a href="#">Ethics and Good Governance, 2023 Proxy Statement, Board of Directors, Board Committees</a>	EM-MM-510a.1			1	





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2-10	Nomination and selection of the highest governance body	<a href="#">2023 Proxy Statement, Governance and Nominating Committee</a>					
2-11	Chair of the highest governance body	<a href="#">2023 Proxy Statement, Governance Documents</a>					The chairman of the board at the end of 2022 was Steven W. Williams.
2-12	Role of the highest governance body in overseeing the management of impacts	<a href="#">Corporate Governance, Board of Directors, Officers, Safety, Sustainability and Public Issues Committee, Audit Committee</a>					
2-13	Delegation of responsibility for managing impacts	<a href="#">Ethics and Good Governance, Stakeholder Engagement, Safety, Sustainability and Public Issues Committee</a>		5, 8, 12	2		Alcoa's CEO, who reports to and is a member of the Board of Directors, has ultimate responsibility for environmental, social and governance topics.
2-14	Role of the highest governance body in sustainability reporting				2, 9		Alcoa's Board of Directors (BOD) and its committees review impacts, risks and opportunities at regularly scheduled board/committee meetings. The BOD does not have an active role in the sustainability report's development. Senior leaders are responsible for the report's content.
2-15	Conflicts of interest	<a href="#">Ethics, Annual Report, 2023 Proxy Statement, Governance and Nominating Committee</a>	EM-MM-510a.1		1		
2-16	Communication of critical concerns	<a href="#">Ethics, Stakeholder Engagement, Integrity Line, Contact Overview</a>			1, 3		
2-17	Collective knowledge of the highest governance body	<a href="#">Board of Directors</a>			2		
2-18	Evaluation of the performance of the highest governance body	<a href="#">2023 Proxy Statement</a>					The BOD annually assesses the effectiveness of the full board, the operation of its committees and the contributions of directors.
2-19	Remuneration policies	<a href="#">2023 Proxy Statement</a>					
2-20	Process to determine remuneration	<a href="#">2023 Proxy Statement</a>					
2-21	Annual total compensation ratio	<a href="#">2023 Proxy Statement</a>					We report the global ratio only.
2-22	Statement on sustainable development strategy	<a href="#">Letter to Our Stakeholders</a>					





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GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle	ASI Requirement	Note
2-23	Policy commitments	<a href="#">Ethics and Good Governance, Human Rights, EHS Policy, Code of Conduct, Ethics and Compliance</a>	EM-MM-510a.1	3, 5, 8, 10, 12, 16	1, 3, 4		
2-24	Embedding policy commitments						
2-25	Processes to remediate negative impacts	<a href="#">Stakeholder Engagement, Integrity Line</a>		16			
2-26	Mechanisms for seeking advice and raising concerns	<a href="#">Ethics, Stakeholder Engagement, Integrity Line, Contact Overview</a>		16	1	3.4f	
2-27	Compliance with laws and regulations	<a href="#">Ethics and Good Governance</a>		16			
2-28	Membership associations	<a href="#">ESG Transparency and Disclosure</a>		17	10		
2-29	Approach to stakeholder engagement	<a href="#">Stakeholder Engagement</a>	EM-MM-210b.1 EM-MM-310a.2	17	9, 10		
2-30	Collective bargaining agreements	<a href="#">Talent Attraction, Retention and Development, Annual Report</a>	EM-MM-310a.1	8	3		
	Environmental and Social Impact Assessments	<a href="#">Risk Management, Stakeholder Engagement, Key 2022 Stakeholder Issues Table</a>				2.5g	
<b>GRI 3: Material Topics 2021</b>							
3-1	Process to determine material topics	<a href="#">Reporting and Materiality</a>					
3-2	List of material topics	<a href="#">Reporting and Materiality</a>				3.1b	
3-3	Management of material topics	<a href="#">Sustainability Approach, Annual Report</a>				3.1a	The management of material impacts is described throughout the sustainability report.
<b>GRI 201: Economic Performance</b>							
201-1	Direct economic value generated and distributed	<a href="#">Shared Value Creation</a>	EM-MM-210b.1	5, 8, 10	9		
201-2	Financial implications and other risks and opportunities due to climate change	<a href="#">Climate Change</a>		13	4, 6		
201-3	Defined benefit plan obligations and other retirement plans	<a href="#">Annual Report</a>					





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<b>GRI 204: Procurement Practices</b>							
3-3	Management of material topics	<a href="#">Supply Chain Management</a>					
204-1	Proportion of spending on local suppliers	<a href="#">Shared Value Creation</a>		8			
<b>GRI 205: Anti-Corruption 2016</b>							
3-3	Management of material topics	<a href="#">Ethics and Good Governance</a>					
205-2	Communication and training about anti-corruption policies and procedures	<a href="#">Ethics</a>		16			
<b>GRI 302: Energy 2016</b>							
3-3	Management of material topics	<a href="#">Energy Use and Efficiency</a>					
302-1	Energy consumption within the organization	<a href="#">Energy Use and Efficiency</a>	EM-MM-130a.1	7, 9, 12, 13	6	5.1a	We do not purchase credits or certify specific renewable energy sources but will evaluate the feasibility in the future.
302-2	Energy consumption outside of the organization	<a href="#">Energy Use and Efficiency</a>		7, 9, 12, 13	6	5.1a	
302-3	Energy intensity	<a href="#">Energy Use and Efficiency</a>		7, 9, 12, 13	6	5.1a	
302-4	Reduction of energy consumption	<a href="#">Energy Use and Efficiency</a>		7, 9, 12, 13	6	5.1a	
302-5	Reductions in energy requirements of products and services	<a href="#">Products, Climate Change, Circular Economy and Waste Management</a>		7, 9, 12, 13	6	5.1a	
<b>GRI 303: Water and Effluents 2018</b>							
3-3	Management of material topics	<a href="#">Water Stewardship</a>				6.2g, 7.2e	
303-1	Interactions with water as a shared resource	<a href="#">Water Stewardship</a>		6, 12, 14	6	6.2a	
303-2	Management of water discharge-related impacts	<a href="#">Water Stewardship</a>	EM-MM-140a.2	6, 12, 14	6	7.1b	
303-3	Water withdrawal	<a href="#">Water Stewardship</a>	EM-MM-140a.1	6, 9, 12, 14	6	7.1a	





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303-4	Water discharge	<a href="#">Water Stewardship</a>	EM-MM-140a.1	6, 9, 12, 14	6	6.2a	
303-5	Water consumption	<a href="#">Water Stewardship</a>	EM-MM-140a.1	6, 9, 12, 14	6		
<b>GRI 304: Biodiversity 2016</b>							
3-3	Management of material topics	<a href="#">Biodiversity and Mine Rehabilitation</a>					
304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	<a href="#">Biodiversity and Mine Rehabilitation</a>	EM-MM-160a.3	15	7		
304-2	Significant impacts of activities, products and services on biodiversity	<a href="#">Biodiversity and Mine Rehabilitation</a>	EM-MM-160a.1	14, 15	6, 7		
304-3	Habitats protected or restored	<a href="#">Biodiversity and Mine Rehabilitation</a>		14, 15	7		
304-4	IUCN Red List species and national conservation list species with habitats in areas affected by operations	<a href="#">Biodiversity and Mine Rehabilitation</a>	EM-MM-160a.3	14, 15	7		
<b>GRI 305: Emissions 2016</b>							
3-3	Management of material topics	<a href="#">Climate Change</a>				5.3e	
305-1	Direct (Scope 1) GHG emissions	<a href="#">Climate Change</a>	EM-MM-110a.1 EM-MM-110a.2	9, 13	6	5.1a	
305-2	Energy indirect (Scope 2) GHG emissions	<a href="#">Climate Change</a>		9, 13	6	5.1a	
305-3	Other indirect (Scope 3) GHG emissions	<a href="#">Climate Change</a>		9, 12, 13	6	5.1a	
305-4	GHG emissions intensity	<a href="#">Climate Change</a>		9, 12, 13	6	5.1a	
305-5	Reduction of GHG emissions	<a href="#">Products, Climate Change, Circular Economy and Waste Management</a>		9, 12, 13	6	5.1a	





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GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle	ASI Requirement	Note
305-6	Emissions of ozone-depleting substances (ODS)			9, 12, 13	6		We use halon as a fire suppressant in several of our locations. These systems are being phased out once they are depleted or expired.
305-7	Nitrogen oxides (NO <sub>x</sub> ), sulfur oxides (SO <sub>x</sub> ), and other significant air emissions	<a href="#">Air Emissions</a>	EM-MM-120a.1	9, 12	6	6.1a	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.
	GHG Emissions Reduction Plans	<a href="#">Strategic Long-Term Goals, Climate Change</a>			6	5.3b iii, 5.3e	
	Air Emissions Reduction Plans	<a href="#">Air Emissions</a>			6	6.1f	
<b>GRI 306: Waste 2020</b>							
3-3	Management of material topics	<a href="#">Circular Economy and Waste Management</a>					
306-1	Waste generation and significant waste-related impacts	<a href="#">Circular Economy and Waste Management</a>	EM-MM-150a.4	3, 12, 15			
306-2	Management of significant waste-related impacts	<a href="#">Circular Economy and Waste Management</a>	EM-MM-150a.10	3, 12, 15		6.5a	
306-3	Waste generated	<a href="#">Circular Economy and Waste Management</a>	EM-MM-150a.4	3, 12, 15	6, 8		
306-4	Waste diverted from disposal	<a href="#">Circular Economy and Waste Management</a>		3, 12, 15			
306-5	Waste directed to disposal	<a href="#">Circular Economy and Waste Management</a>		3, 12, 15			
	Total weight of hazardous waste generated	<a href="#">Circular Economy and Waste Management</a>	EM-MM-150a.7				
	Total weight of hazardous waste generated	<a href="#">Circular Economy and Waste Management</a>	EM-MM-150a.8				
	Spills					6.4b	
<b>GRI 307: Environmental Compliance 2016</b>							
3-3	Management of material topics	<a href="#">Environmental Compliance</a>					
307-1	Non-compliance with environmental laws and regulations	<a href="#">Environmental Compliance</a>			6	3.2	





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<b>GRI 308: Supplier Environmental Assessment 2016</b>							
3-3	Management of material topics	<a href="#">Supply Chain Management</a>					
308-1	New suppliers that were screened using environmental criteria	<a href="#">Supply Chain Management</a>		8, 12	3, 10		We continuously screen all suppliers, but do not disaggregate counts. That is, we do not track new suppliers separately.
308-2	Negative environmental impacts in the supply chain and actions taken	<a href="#">Supply Chain Management</a>		8, 12	3, 10		
<b>GRI 403: Occupational Health and Safety 2018</b>							
3-3	Management of material topics	<a href="#">Safety and Health</a>				11.1e	
403-1	Occupational health and safety management system	<a href="#">Safety and Health</a>		3, 8	5	11.1e	
403-2	Hazard identification, risk assessment, and incident investigation	<a href="#">Safety and Health</a>		3, 8	5	11.1e	
403-3	Occupational health services	<a href="#">Safety and Health</a>		3, 8	5		
403-4	Worker participation, consultation, and communication on occupational health and safety	<a href="#">Safety and Health</a>		3, 8	5		
403-5	Worker training on occupational health and safety	<a href="#">Safety and Health</a>	EM-MM-320a.1	3, 8	5		
403-6	Promotion of worker health	<a href="#">Safety and Health</a>		3, 8	5		
403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	<a href="#">Safety and Health</a>		3, 8	5		
403-8	Workers covered by an occupational health and safety management system	<a href="#">Safety and Health</a>		3, 8	5		
403-9	Work-related injuries	<a href="#">Safety and Health</a>	EM-MM-320a.1	3, 8	5		
403-10	Work-related ill health	<a href="#">Safety and Health</a>		3, 8	5		





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GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle	ASI Requirement	Note
<b>GRI 404: Training and Education 2016</b>							
3-3	Management of material topics	<a href="#">Talent Attraction, Retention and Development</a>					
404-1	Average hours of training per year per employee	<a href="#">Talent Attraction, Retention and Development</a>		8			
404-2	Programs for upgrading employee skills and transition assistance programs	<a href="#">Talent Attraction, Retention and Development</a>		8			
404-3	Percentage of employees receiving regular performance and career development reviews	<a href="#">Talent Attraction, Retention and Development</a>		8			
<b>GRI 405: Diversity and Equal Opportunity 2016</b>							
3-3	Management of material topics	<a href="#">Inclusion, Diversity and Equity</a>				9.2e	
405-1	Diversity of governance bodies and employees	<a href="#">Inclusion, Diversity and Equity</a>		5, 8, 10		3	
405-2	Ratio of basic salary and remuneration of women to men	<a href="#">Inclusion, Diversity and Equity</a>		5, 8, 10		3	
<b>GRI 411: Rights of Indigenous Peoples 2016</b>							
3-3	Management of material topics	<a href="#">Indigenous and Land-Connected People</a>					
411-1	Incidents of violations involving rights of indigenous peoples	<a href="#">Indigenous and Land-Connected People</a>	EM-MM-210a.3	16	3		
<b>GRI 412: Human Rights Assessment 2016</b>							
3-3	Management of material topics	<a href="#">Human Rights</a>					
412-1	Operations that have been subject to human rights reviews or impact assessments	<a href="#">Human Rights</a>	EM-MM-210a.3	5, 8, 10, 16	3	2.6h	
<b>GRI 413: Local Communities 2016</b>							
3-3	Management of material topics	<a href="#">Local Commitment with Communities</a>					





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GRI Disclosure	Description	Location	SASB	UN SDG	ICMM Principle	ASI Requirement	Note
413-1	Operations with local community engagement, impact assessments, and development programs	<a href="#">Local Commitment with Communities</a>	EM-MM-210b.1 EM-MM-210b.2	17	3		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.
413-2	Operations with significant actual and potential negative impacts on local communities	<a href="#">Local Commitment with Communities</a>		17	3		
<b>GRI 414: Supplier Social Assessment 2016</b>							
3-3	Management of material topics	<a href="#">Supply Chain Management</a>					
414-1	New suppliers that were screened using social criteria	<a href="#">Supply Chain Management</a>		8, 12	3, 10		We continuously screen all suppliers, but do not disaggregate counts. That is, we do not track new suppliers separately.
414-2	Negative social impacts in the supply chain and actions taken	<a href="#">Supply Chain Management</a>		8, 12	3, 10		
<b>GRI 415: Public Policy 2016</b>							
415-1	Political contributions	<a href="#">Ethics</a>		16		3.3c	
	Payments to governments	<a href="#">Shared Value Creation</a>				3.3b	
<b>Other</b>							
	Affected Populations and Organisations	<a href="#">Key 2022 Stakeholder Issues Table</a>			3	9.7g	





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Appendix B

# ERM CVS Limited Assurance Statement

The following is the content of the full assurance statement. The original can be found on our website.

[Read more: ERM CVS Limited Assurance Statement](#)

## Independent Limited Assurance Statement to Alcoa Corporation

ERM Certification & Verification Services Incorporated (“ERM CVS”) was engaged by Alcoa Corporation (“Alcoa”) to provide limited assurance in relation to the selected information set out below and presented in the Alcoa 2022 Sustainability Report for year ending 31 December 2022 (the “Report”).

Engagement summary	
<b>Scope of our assurance engagement</b>	<p>Whether Alcoa’s assertions relating to the following ICMM Subject Matters (SM) are fairly presented in the Report, in all material respects, in accordance with the reporting criteria:</p> <ul style="list-style-type: none"> <li>• <b>SM1:</b> The alignment of Alcoa’s sustainability policies, management standards and procedures to the ICMM Principles, any mandatory requirements set out in ICMM Position Statements, the corporate-level ICMM Performance Expectations (PEs) and corporate-level aspects of the combined PEs.</li> <li>• <b>SM2:</b> Alcoa’s material sustainability risks and opportunities based on its own review of the business and the views and expectations of its stakeholders.</li> <li>• <b>SM3:</b> The existence of systems and approaches that Alcoa is using to manage selected material sustainability risks and opportunities.</li> <li>• <b>SM4:</b> Alcoa’s reported performance during the given reporting period for selected material sustainability risks and opportunities, as listed in Table 1 below.</li> <li>• <b>SM5:</b> Disclosures regarding Alcoa’s prioritisation process for selecting assets for third-party PE Validation.</li> </ul> <p>Our assurance engagement does not extend to information in respect of earlier periods or to any other information included in the Report.</p>
<b>Reporting period</b>	2022 (1 January 2022 – 31 December 2022)





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Engagement summary	
<b>Reporting criteria</b>	ICMM Assurance and Validation Procedure (March 2023), including the ICMM Principles, ICMM Position Statements and ICMM Performance Expectations  Alcoa Basis of reporting the selected environmental, social, health, safety indicators as disclosed within the Report
<b>Assurance standard and level of assurance</b>	We performed a limited assurance engagement, in accordance with the International Standard on Assurance Engagements ISAE 3000 (Revised) 'Assurance Engagements other than Audits or Reviews of Historical Financial Information' issued by the International Auditing and Standards Board and ISO 14064:3 for Greenhouse Gas data.  The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for a reasonable assurance engagement and consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.
<b>Respective responsibilities</b>	Alcoa is responsible for preparing the Report and for the collection and presentation of the information within it, and for the designing, implementing and maintaining of internal controls relevant to the preparation and presentation of the Selected Information.  ERM CVS' responsibility is to provide conclusions to Alcoa on the agreed scope based on our engagement terms with Alcoa, the assurance activities performed and exercising our professional judgement. We accept no responsibility, and deny any liability, to any party other than Alcoa for the conclusions we have reached.

**Our conclusion**

Based on our activities, as described below, nothing has come to our attention to indicate that the 2022 data and information for the disclosures listed under 'Scope' above are not fairly presented in the Report, in all material respects, in accordance with the reporting criteria.

**Our assurance activities**

Considering the level of assurance and our assessment of the risk of material misstatement of the selected information a multi-disciplinary team of sustainability and assurance specialists performed a range of procedures that included, but was not restricted to, the following:

- Assessing the appropriateness of the reporting criteria for the selected information presented in the Report.
- A review of external media reporting relating to Alcoa to identify sustainability issues in the reporting period that may be relevant to the assurance scope.
- Interviews with a selection of staff and management to gain an understanding of:
  - Alcoa sustainability strategy, policies and management systems, including stakeholder engagement and materiality assessment;
  - The status of implementation of the ICMM Mining Principles (including the corporate-level PEs and corporate-level aspects of the combined PEs) and ICMM Position Statements in Alcoa's strategy and policies;
- Alcoa's identification and management of sustainable development risks and opportunities as determined through its review of the business and the views and expectations of stakeholders; and
- The relevant management systems and processes (including internal review and control processes) used for collecting and reporting the selected disclosures.
- Confirming that Alcoa's policies and procedures in effect remain aligned with the ICMM Mining Principles and other mandatory requirements set out in the ICMM Position Statements in effect as of 31 December 2022.
- Testing the processes and systems, including internal controls, used to generate, consolidate and report the selected information.
- Interviews with management representatives responsible for managing the selected issues.
- A review at corporate level of a sample of qualitative and quantitative evidence supporting the reported information.





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- An analytical review of the year-end data submitted by all locations included in the consolidated 2022 group data for the selected disclosures which included testing the completeness and mathematical accuracy of conversions and calculations, and consolidation in line with the stated reporting boundary.
- In-person visits to the following sites to review source data and local reporting systems and controls:
  - Poços de Caldas, Brazil;
  - Deschambault, Canada;
  - Warrick, United States of America.
- Confirming conversion and emission factors and assumptions used.
- Reviewing 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**

The reliability of the assured information is subject to inherent uncertainties, given the available methods for determining, calculating or estimating the underlying information. It is important to understand our assurance conclusions in this context.

**BETH WYKE**

Head of Corporate Assurance Services  
Malvern, PA

June 16, 2023

ERM Certification & Verification Services Incorporated  
[www.ermcvs.com](http://www.ermcvs.com) | [post@ermcvs.com](mailto:post@ermcvs.com)

**Our independence, integrity and quality control**

ERM CVS is an independent certification and verification body accredited by UKAS to ISO 17021:2015. Accordingly we maintain a comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements. Our quality management system is at least as demanding as the relevant sections of ISQM-1 and ISQM-2 (2022).

ERM CVS applies a Code of Conduct and related policies to ensure that its employees maintain integrity, objectivity, professional competence and high ethical standards in their work. Our processes are designed and implemented to ensure that the work we undertake is objective, impartial and free from bias and conflict of interest. Our certified management system covers independence and ethical requirements that are at least as demanding as the relevant sections of Parts A & B of the IESBA Code relating to assurance engagements.

The team that has undertaken this assurance engagement has extensive experience in conducting assurance on environmental, social, ethical and health and safety information, systems and processes, and provides no consultancy related services to Alcoa in any respect.







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**Table 1**

Selected indicators for the 2022 reporting period in our limited assurance scope and disclosed by Alcoa in the Report.

Indicator	Unit	Page number
<b>Environment</b>		
Direct (Scope 1) GHG emissions	Million metric tons of CO <sub>2</sub> e	83
Indirect (Scope 2 location based) GHG emissions	Million metric tons of CO <sub>2</sub> e	83
GHG Intensity (scope 1 + 2, refining and smelting segments)	Metric tons of CO <sub>2</sub> e per metric ton of aluminum	83
Scope 3 GHG Emissions	Million metric tons of CO <sub>2</sub> e: Total, Category 1, Category 3, Category 4, Category 9, Category 10	84
Perfluorocarbon Emissions	Million metric tons of CO <sub>2</sub> e: Total (smelters only)	83
Electricity from renewable sources	Percent (smelters only)	87
Energy consumption – Direct	Thousands of gigajoules: Total	86
Energy consumption – Purchased Electricity	Thousands of megawatt hours: Total	86
Operational Water Withdrawal (Inputs) (All WAF Categories)	Million cubic meters: Total (all sites), Total (Locations in Alcoa-defined Water-scarce areas	107, 108
Operational Water Consumption (Outputs) (All WAF Categories)	Million cubic meters: Total (all sites), Total (Locations in Alcoa-defined Water-scarce areas	107, 108
Operational Water Discharges (Outputs) (All WAF Categories)	Million cubic meters: Total (all sites), Total (Locations in Alcoa-defined Water-scarce areas	107, 108
Water Use	Percent: Locations in Alcoa-defined Water-scarce Areas	105
Waste to Landfill	Thousands of metric tons: Total	118
Non-mineral waste generated	Thousands of metric tons: Total (Hazardous and non-hazardous)	118
Non-mineral waste recovered	Thousands of metric tons: Total (Hazardous and non-hazardous)	118
Non-mineral waste disposed	Thousands of metric tons: Total (Hazardous and non-hazardous)	118
Bauxite residue generated	Million metric tons	117
Active mining disturbance to mine rehabilitation ratio	Number	100
<b>Social</b>		
Community complaints raised through local complaint and grievance mechanism	Number: Total, per region	58
<b>Health and Safety</b>		
Fatality Incidents	Number: Total	126
FSI-Actual incidents (FSI-A)	Number: Total	126
Days Away, Restricted or Transfer (DART) incidents	Number: Total	126
Lost Work Day (LWD) incidents	Number: Total	127





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Appendix C

# 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 and all contractors

Year	Global	Australia	Europe	North America	South America
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
2022	0	0	0	0	0

\*Zero employee fatalities, one contractor fatality.

## Fatalities by Gender

Employees and all contractors

Year	Male	Female	Total
2018	0	0	0
2019	0	0	0
2020	1	0	1
2021	0	0	0
2022	0	0	0

## Fatal and Serious Injuries/Illnesses

Employees and all contractors

Year	FSI Actuals Events resulting in a fatal or serious injury /illness	FSI Potentials Near-miss events	Total FSI Events	Total FSI Rate
2018	3	427	430	1.84
2019	3	339	342	1.38
2020	1	387	388	1.41
2021	3	309	312	1.80
2022	1	331	331	1.02

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 Rate

Employees and all contractors

Year	Global	Australia	Europe	North America	South America
2018	0.71	0.96	0.64	1.03	0.27
2019	0.87	1.21	0.82	1.26	0.35
2020	0.61	1.21	0.58	0.65	0.24
2021	0.57	1.42	0.46	0.60	0.12
2022	0.71	1.64	0.47	1.47	0.22





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### Days Away, Restricted and Transfer Rate

Employees and supervised contractors

Year	Global	Australia	Europe	North America	South America
2018	1.01	1.16	0.79	1.23	0.18
2019	1.30	1.37	0.92	1.59	0.64
2020	0.90	1.44	0.79	0.76	0.17
2021	0.92	1.60	0.57	0.71	0.00
2022	1.29	1.83	0.70	1.84	0.17

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

### Days Away, Restricted and Transfer Incidents by Gender

Employees and supervised contractors

Year	Male	Female	Total
2018	127	17	144
2019	170	12	182
2020	119	12	131
2021	116	12	128
2022	153	20	173

### Days Away, Restricted and Transfer Rate

Non-supervised contractors

Year	Global	Australia	Europe	North America	South America
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
2022	0.30	1.16	0.00	0.19	0.22

Because contractors not directly supervised by Alcoa maintain their own safety and health programs and are accountable for investigating incidents involving their employees, certain details associated with their internal investigations are not fully transparent to Alcoa.

### Days Away, Restricted and Transfer Incidents by Gender

Non-supervised contractors

Year	Male	Female	Total
2018	35	4	39
2019	44	3	47
2020	36	2	38
2021	34	2	36
2022	52	4	56

### Lost Workday Rate

Employees and all contractors

Year	Global	Australia	Europe	North America	South America
2018	0.22	0.41	0.09	0.24	0.11
2019	0.25	0.52	0.26	0.11	0.18
2020	0.22	0.53	0.11	0.11	0.16
2021	0.25	0.67	0.18	0.19	0.07
2022	0.26	0.71	0.18	0.21	0.14

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

Employees and supervised contractors

Year	Global	Australia	Europe	North America	South America
2018	0.29	0.49	0.13	0.26	0.12
2019	0.33	0.63	0.18	0.11	0.47
2020	0.28	0.67	0.16	0.11	0.06
2021	0.37	0.75	0.21	0.18	0.23
2022	0.40	0.81	0.27	0.22	0.12

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





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### Lost Workday Incidents by Gender

Employees and supervised contractors

Year	Male	Female	Total
2018	40	1	41
2019	45	1	46
2020	39	2	41
2021	46	6	52
2022	49	5	54

### Lost Workday Rate

Non-supervised contractors

Year	Global	Australia	Europe	North America	South America
2018	0.13	0.26	0.00	0.17	0.10
2019	0.19	0.27	0.46	0.11	0.12
2020	0.16	0.17	0.00	0.12	0.18
2021	0.13	0.49	0.11	0.22	0.05
2022	0.15	0.44	0.00	0.19	0.14

Because contractors not directly supervised by Alcoa maintain their own safety and health 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

Year	Male	Female	Total
2018	13	2	15
2019	18	2	20
2020	20	0	20
2021	19	0	19
2022	28	1	29

### Total Recordable Incident Rate

Employees and all contractors

Year	Global	Australia	Europe	North America	South America
2018	1.66	2.38	1.45	2.41	0.55
2019	1.77	2.27	1.48	3.00	0.54
2020	1.37	2.27	1.28	1.90	0.42
2021	1.22	2.61	1.70	1.53	0.20
2022	1.30	2.86	1.49	2.95	0.30

2022 data not yet published by the Bureau of Labor Statistics. 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

Employees and supervised contractors

Year	Global	Australia	Europe	North America	South America
2018	2.33	2.69	1.87	2.81	0.43
2019	2.62	2.50	1.52	3.73	0.70
2020	2.06	2.65	1.63	2.22	0.45
2021	2.01	2.81	1.96	1.93	0.23
2022	2.33	2.91	1.66	3.65	0.25

2022 data not yet published by the Bureau of Labor Statistics. 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.





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**Total Recordable Incidents by Gender**

Employees and supervised contractors

Year	Male	Female	Total
2018	293	40	333
2019	339	28	367
2020	273	31	304
2021	242	37	279
2022	273	40	313

**Total Recordable Incident Rate**

Non-supervised contractors

Year	Global	Australia	Europe	North America	South America
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
2022	0.58	2.71	1.14	0.56	0.31

Because contractors not directly supervised by Alcoa maintain their own safety and health 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 Incidents by Gender**

Non-supervised contractors

Year	Male	Female	Total
2018	88	7	95
2019	92	4	96
2020	69	4	73
2021	71	3	74
2022	98	12	110





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Appendix D

# Key 2022 Stakeholder Issues

## Operational Sites

Location	Issue	Action
<b>Anglesea, Victoria, Australia</b>	<p>Filling the coal mine pit with water is a key enabler to finalizing the Anglesea Mine Rehabilitation and Closure Plan.</p> <p>Through ongoing consultation, some community members have raised concerns about the potential use of groundwater to support the long-term filling strategy, specifically that groundwater extraction could negatively impact the Anglesea River. To further investigate groundwater use, we completed a pumping test, the data from which did not identify any adverse impacts on groundwater-dependent ecosystems, including the Anglesea River.</p> <p>We are using the test's data to develop an updated groundwater model, subject to a rigorous independent peer review process by a government-appointed technical review panel. The updated model will determine if a sustainable extraction rate can be established. A groundwater impact and environmental risk assessment in 2023 will also inform the decision about potential groundwater use in the future.</p>	<p>Consultation with stakeholders remains a priority in the development and regulatory 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>There was a high level of regulatory oversight throughout the pumping test, including monthly results reviews with key regulatory stakeholders. We also kept the community informed via monthly pumping test updates and regular community updates about broader rehabilitation activities that are publicly available.</p> <p><a href="#">Read more: Anglesea Power Station</a></p>
<b>Kwinana, Western Australia</b>	<p>Since the Western Australian Planning Commission (WAPC) adopted the Kwinana air-quality buffer in September 2010, there has been litigation and questions regarding the legitimacy of the buffer and land uses in the area, particularly in Mandogalup. The government uses buffers to separate industry and residential development in response to potential health and amenity impacts.</p> <p>In 2019, the Minister for Planning announced the IP47 improvement plan for the Mandogalup area.</p> <p>In December 2021, the IP47 improvement plan was released for public consultation. It concluded in February 2022.</p>	<p>In 2022, we provided input during the IP47 consultation process, urging that a precautionary approach be applied within the buffer zone. We held community engagement sessions in November and December 2022 to update interested residents on our residue operations, the implementation of the GISTM and our position on the IP47 improvement plan.</p>
<b>Portland, Victoria, Australia</b>	<p>Portland Aluminium has conducted annual health assessments of the koala population in the smelter's blue gum plantation since September 2020. Assessments began due to concerns about high koala numbers and the welfare of animals in the area.</p> <p>Information provided by the Department of Environment, Land, Water and Planning (DELWP) indicates the population is growing, and over-browsing is a key contributor to poor koala health. The assessments also found that fluoride deposition in trees near the smelter contributes to poor health in some koalas.</p> <p>Monitoring shows fluoride emissions from the smelter are within Environmental Protection Agency guidelines and do not threaten human health.</p>	<p>In April 2022, we engaged independent consultant Ecoplan Australia to perform a third health assessment of koalas inhabiting the smelter's park lands. The DELWP-approved assessment also included fertility control. Information collected during the assessment, along with analysis by the University of Melbourne, increased our understanding of the koala population and informed the Koala Management Plan.</p> <p>We informed community members and interested stakeholders, including media, of the health assessment and our short-term goals to address koala health concerns. To reduce the risks fluoride can pose to koalas, we began harvesting our main blue gum plantation and other areas of known koala habitat near the smelter. To offset the harvesting and create an alternative koala habitat, we began planting 18 hectares (44 acres) of eucalypt species on land farther away from the smelter in August 2022.</p>





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Location	Issue	Action
Pinjarra, Western Australia	Residue dust impacting Pinjarra refinery neighbors emerged as an issue due to a long, hot, dry and windy 2021 – 2022 summer.	<p>We engaged with multiple regulatory, government, community and environmental stakeholders on this issue in 2022. We discussed dust-monitoring results at each bimonthly community consultation meeting, with a comprehensive overview of dust mitigation practices discussed in September.</p> <p>Local stakeholders visited the site. We also hosted an exhibition-style community information event in Pinjarra, where residents and stakeholders spoke with our technical specialists about residue and dust management. We published advertorials in the local newspaper to summarize our approach to dust management. Our community and environment teams also investigated neighbor complaints, offered home visits to residents and installed additional dust monitors in nearby communities.</p> <p>Numerous research studies over many years by Alcoa and independent experts, including the Commonwealth Scientific and Industrial Research Organisation, university researchers, independent consultancies and government departments, have shown our operations meet Australia's strict environmental guidelines, and our locations and their emissions are safe for our employees and communities.</p> <p><a href="#">Read more: Commonwealth Scientific and Industrial Research Organization</a></p>
	We did not exceed our regulatory dust limits but did observe an increase in community complaints.	
	Increased local interest saw two community meetings organized and an environmental protection action group established.	
Juruti, Brazil	The Department of Water and Environmental Regulation (DWER) visited the refinery to understand our approach to dust management and community engagement. DWER endorsed our dust suppression measures and process for handling community complaints.	<p>Following the incidents, we created a working group with each of the affected communities. An action plan was agreed upon and included compensation for the damage caused and the provision of food baskets and water until the affected area was returned to its original condition. An initial monthly payment to the affected families was agreed to regarding compensation for the damage.</p> <p>A technical study was performed on the environmental and social impacts, and a second study to translate the impact study into economic values. We paid for both studies and technical expert support for both communities.</p> <p>In April 2022, we provided the completed studies to the communities and authorities. Both studies were conducted independently following applicable methodologies and legislation.</p> <p>The studies concluded that the social and biophysical impacts are reversible following effective corrective actions that have been implemented. The economic valuation quantified the losses and damages suffered by the community, considering the impacts of tangible and intangible accidents.</p> <p>After several discussions during the second half of 2022, no agreement was reached among the parties on the final value of the impact. The next step is arbitration, which is expected to be resolved in the first half of 2023.</p>
	Our Juruti operations in Brazil experienced three minor environmental incidents connected to a significant increase in rainwater during the wet season in December 2020 and February 2021.	
	Due to the heavy rains, the containment wall built around the mining areas that had been cleared for operation failed, causing soil erosion and subsequent turbidity in a drinking water source for the community of Jauari and a fishing area for the community of Capiiranga.	





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Location	Issue	Action
<b>São Luís, Brazil</b>	<p>The Mangue Seco community raised three issues with the Alumar operations:</p> <ol style="list-style-type: none"> <li>1. The community felt there was a lack of public information about the facility's impoundment risks, impacts, and emergency response plan (ERP) and drill.</li> <li>2. The community claims ownership of an area in Alumar's concession. The community wants to do construction in the area in addition to using it for agricultural purposes.</li> <li>3. The community raised concern over increased turbidity in the water of the Pedrinhas River and suspects it may be connected to Alumar's impoundment construction.</li> </ol>	<p>We participated in a public hearing with the community and various authorities to discuss the issues. We provided documentation on the environmental controls and structural integrity of the impoundments and shared additional information about the facility's ERP.</p> <p>We also explained that the claimed area is within Alumar's concession. The state granted it as a buffer zone for industrial installations and therefore it cannot be used for construction or other purposes.</p> <p>Regarding the increase of turbidity in the river, an environmental investigation will be completed in 2023.</p>
<b>Baie Comeau, Canada</b>	<p>In August 2005, a resident of Baie Comeau filed a Motion for Authorization to Institute a Class Action and for Designation of a Class Representative against Alcoa Canada Ltd., Alcoa Limitée, Société Canadienne de Metaux Reynolds Limitée and Canadian British Aluminum (collectively known as "Alcoa"). The motion alleged the defendants—present and past owners and operators of our Baie Comeau smelter—had negligently emitted polycyclic aromatic hydrocarbons (PAHs) from the smelter's Soderberg pots, which were dismantled in 2013.</p> <p>It was alleged the residents of the St. Georges neighborhood suffered property damage, various inconveniences and stress associated with claimed increased health risks.</p> <p>In May 2007, the court authorized a class action suit on behalf of all owners, tenants or residents of the St. Georges neighborhood who suffered damages caused by the PAH emissions from the smelter.</p>	<p>In March 2022, we reached a negotiated settlement with the Regroupement des citoyens du quartier St-Georges de Baie-Comeau. The C\$13 million settlement was approved by the Québec Superior Court in May 2022.</p>
<b>Mosjøen, Norway</b>	<p>In April 2020, the Norwegian Sámi Association contacted us regarding our PPA with Øyfjellet Wind Farm. Parts of the wind farm are built in a trekking route that reindeer herds have traditionally used to access a winter grazing area. It was alleged that through our energy supply agreement with the project developer, we enabled a project that impeded the traditional livelihoods of the Sámi people and therefore violated our Ethics and Compliance Framework.</p> <p>The local Jillian-Njaarke Reindeer District subsequently filed a motion to halt construction of the wind-power project on the grounds it illegally closed off reindeer trekking routes. Both the Civil Court and the Court of Appeals rejected this claim.</p> <p>The settlement case between Øyfjellet and Jillian-Njaarke is scheduled to start in May 2023, with Jillian-Njaarke intending to challenge the legal standing of the project.</p> <p>In a settlement case between another wind-power project and a reindeer district farther south (Fosen Vind and Fovsen-Njaarke Reindeer District), the Norwegian Supreme Court indicated it could not rule on a settlement as it saw the project as incompatible with UN Article 27 of the International Covenant on Civil and Political Rights. The Supreme Court later clarified it had not ruled the project itself was illegal, and it expected the Ministry of Energy (OED) to resolve the future of the project.</p>	<p>In May 2023, Jillian-Njaarke will meet project developer Eolus in a settlement court case.</p> <p>We are not a party to this case or the discussions between the district and developer, but we intend to meet with both parties beforehand to explore whether we can contribute to a constructive solution.</p>





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<b>A Coruña and Avilés, Spain</b>	Following the divestiture of our facilities in A Coruña and Avilés in 2019, we faced various employee-related legal disputes.	In April 2022, we reached a unanimous agreement with all active workers of the divested facilities. We will make the cash payments to the employees upon completion of certain administrative and judicial approvals.
<b>San Ciprián, Spain</b>	In December 2021, we reached an agreement with the employee representatives at our San Ciprián smelter to help resolve ongoing challenges stemming from exorbitant energy prices. The agreement calls for a two-year curtailment of the smelter's 228,000 metric tons of annual capacity, with a commitment to begin restarting the smelter in January 2024. The casthouse will continue operating during the curtailment.	<p>During the curtailment period, we committed to securing long-term PPAs for the smelter. As of December 2022, we had secured two PPAs that would provide approximately 75 percent of the smelter's base load.</p> <p>We also committed:</p> <ul style="list-style-type: none"> <li>• US\$68 million for capital investments;</li> <li>• US\$35 million for restart costs;</li> <li>• Full wages and benefits to employees during the two-year curtailment period;</li> <li>• Extension of contracts with contractor companies through 2024;</li> <li>• A new collective bargaining agreement that includes pay increases extending to the end of 2025; and</li> <li>• No consideration of a collective dismissal process until Dec. 31, 2025, at the earliest.</li> </ul> <p>The updated agreement includes increased investments in the facility and protections for the workforce. We agreed to provide a total of US\$181 million for capital investments and restart expenses, which is US\$78 million more than the original agreement.</p>
<b>Addy, Washington, USA</b>	In July 2022, we announced the closure of our Northwest Alloys site in Addy, Washington. The site had been fully curtailed since 2001.	<p>The site had two contractors present at the time of closing, who will remain to assist with demolition and redevelopment work.</p> <p>We will continue working with local and regional stakeholders to explore redevelopment opportunities.</p>





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### Curtailed and Non-Operational Sites

Location	Issue	Action
<b>Badin, North Carolina, USA</b>	The site is anticipating receipt of a draft NPDES (National Pollutant Discharge Elimination System) permit from the North Carolina Department of Environmental Quality in 2023. The impending draft has sparked interest among non-governmental organizations who are concerned the site may have undiscovered environmental challenges. The site's sole permit exceedance is fluoride, which averages 1.9 ppm. North Carolina's fluoride limit is 1.8 ppm, and the U.S. EPA maximum drinking water standard is 4.0 ppm.	A university was contracted to provide independent data sampling and third-party meeting facilitation to foster increased communication with the community, and confidence in test results. A community meeting was held to discuss the progressive remediation of the site for over 25 years and expand the dialogue with the community. Additionally, we held Community Advisory Board meetings throughout the year to gain additional perspective and understanding of the thoughts and concerns of residents representing diverse backgrounds.
<b>Paranam, Suriname</b>	Surinamese pensioners who elected to receive their pension in local currency (Surinamese Dollar or SRD), which included medical care upon retirement, are seeking adjustment to their pension due to SRD devaluation. Some pensioners have filed related litigation in the court.	Alcoa has offered all pensioners receiving their pension in SRD the option to change their original election to a USD-based pension. While the latter option did not include medical benefits as part of the package, it is not subject to SRD devaluation.
<b>Aransas and San Patricio Counties, Texas, USA</b>	Local stakeholders raised concerns regarding the contents of the four inactive bauxite residue impoundments at Copano that are adjacent to Port Bay and near Copano Bay. Residue placement at Copano occurred from 1969 until 2016; Alcoa acquired the site in 2018.	The project team met with Aransas County officials to discuss the remedial program at the site along with measures designed to maintain levee integrity. Meetings and discussions were also held with the Texas Commission on Environmental Quality regarding overall site environmental conditions, consistent lack of evidence of any release from the impoundments to the environment, and the closure program for Bed 1. Project updates are maintained on a website.
<b>Point Comfort, Texas, USA</b>	The U.S. EPA issued a Record of Decision (ROD) designating the site a Superfund site in December 2001. The ROD and subsequent Consent Decree set forth the remedy, which included actions to address contaminated sediments and wastewater discharges in Lavaca Bay, and subsurface contamination at the former chlor-alkali processing plant and former Witco coal tar processing plant. Assessment, monitoring and remedial actions continue at the site; the U.S. EPA has determined that near-term effectiveness of the remedy has been achieved.	An annual stakeholder meeting was held in November to update a broad range of stakeholder representatives from the community, government, and area organizations on the continued progress of site cleanup measures. Meetings and discussions with the U.S. EPA also occurred through the year. Additionally, outside of Superfund requirements, quarterly meetings are held with Point Comfort officials to discuss site dust control measures and receive feedback on their effectiveness. Community dusting concerns have not been reported in several years due to the maintenance of dust control measures and actioning of community feedback.
<b>East St. Louis, Illinois, USA</b>	The Company's former aluminum refinery site began operations in 1902. The plant operated until the late 1950's, at which time demolition and sale of associated property commenced. Site investigations began in 2001 and remedial action for the former bauxite residue impoundments began in 2014. The site is currently being addressed through the U.S. EPA Superfund Alternative (SA) approach.	Alcoa Transformation team members participated in several U.S. EPA-led community advisory group sessions held in 2022 to be available to the community and listen to concerns. Interaction with the community will continue through the completion of remedial actions.



Appendix E

# Acronyms

**ABLE**

Alcoans moving Beyond Limited Expectations

**ABI**

Aluminerie de Bécancour

**ACOGLEC**

Association of Gleba Curumucuri Communities

**ACOPRUMS**

Association of Prudente and Monte Sinai Communities

**ACORJUVE**

Association of Communities of the Juruti Velho Region

**AMS**

Aluminiumindustriens Miljøsekretariat

**ANM**

Brazilian National Mining Agency

**APS**

Sustainable Poços Association

**ARENA**

Australian Renewable Energy Agency

**ASI**

Aluminium Stewardship Initiative

**AWARE**

Alcoans Working Actively for Racial-Ethnic Equality

**AWN**

Alcoa Women's Network

**CAHRA**

Conflict-affected and high-risk area

**CBG**

Compagnie des bauxites de Guinee

**CoE**

Center of Excellence

**COSO**

Committee of Sponsoring Organizations of the Treadway Commission

**DART**

Days away, restricted and transferred

**DEECA**

Department of Energy, Environment and Climate Action

**DOJ**

U.S. Department of Justice

**DPLO**

Data Protection Liaison Officer

**E&C**

Ethics and Compliance

**EAGLE**

Employees at Alcoa for LGBT+ Equality

**EC**

Electric Calcination

**EEM**

External Environmental Monitoring

**EHS**

Environment, Health and Safety

**EINRC**

East Iceland Nature Research Centre

**EITI**

Extractive Industries Transparency Initiative

**ENRD**

Environment and Natural Resources Division of the DOJ

**EPA**

Environmental Protection Agency

**EPD**

Environmental Product Declaration

**ERM**

Enterprise Risk Management

**ERM CVS**

Environmental Resources Management – Certification and Verification Services Inc.

**ESG**

Environmental, Social and Governance

**ESIA**

Environmental and social impact assessment

**ESPIAL**

Environmental Sustainability of Production of Primary Aluminium

**ET**

Executive Team

**EV**

Electric Vehicle

**FSI-P**

Fatality and Severe Injury/Illness Potential

**GDPR**

General Data Protection Regulation





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**GHG**

Greenhouse Gas

**GIDEC**

Global Inclusion, Diversity  
& Equity Council

**GISTM**

Global Industry Standard  
on Tailings Management

**GRI**

Global Reporting Initiative

**HDPE**

High-density polyethylene

**HILT CRC**

Heavy Industry Low-Carbon Transition  
Cooperative Research Centre

**HOP**

Human and organizational performance

**HRIA**

Human Rights Impact Assessments

**HRREC**

Human Rights Resources  
and Energy Collaborate

**IAI**

International Aluminium Institute

**ICMM**

International Council  
on Mining & Metals

**IDAHOBIT**

International Day Against Homophobia,  
Biphobia, Interphobia & Transphobia

**IDE**

Inclusion, Diversity and Equity

**IEA**

International Energy Agency

**IG**

Inclusion Group

**INCRA**

National Institute of Colonization  
and Agrarian Reform

**IPCC**

United Nations Intergovernmental  
Panel on Climate Change

**ISAE**

International Standard on  
Assurance Engagements

**ISO**

International Organization  
for Standardization

**KLIM**

Organisation of Kaliña  
and Lokono in Marowijne

**LEED**

Leadership in Energy &  
Environmental Design

**MFA**

Materials Flow Analysis

**MVR**

Mechanical Vapor Recompression

**NGER**

National Greenhouse and Energy  
Reporting

**NMA**

Non-Metallurgical Alumina

**NOV**

Notice of Violation

**OECD**

Organisation for Economic  
Co-operation and Development

**ORM**

Operational Risk Management

**OTR**

Off-the-road

**PDP**

People Development Process

**PE**

Performance Expectations

**PPA**

Power Purchase Agreements

**PPO**

Privacy Program Office

**RAP**

Reconciliation Action Plan

**R&D**

Research and development

**ROD**

Record of Decision

**RMI**

Rocky Mountain Institute

**SASB**

Sustainability Accounting  
Standards Board

**SBTi**

Science Based Targets initiative

**SGB**

Sustainability Governance Board

**SM**

Subject Matters

**SPL**

Spent pot lining

**TSA**

Tyre Stewardship Australia

**UN SDGs**

United Nations Sustainable  
Development Goals

**VPSHR**

Voluntary Principles on  
Security and Human Rights



Appendix F

# 2022 Awards and Recognitions

## GLOBAL

### Bloomberg LP

Gender Equality Index Member

### EcoVadis

Platinum Member

### FORTUNE

World's Most Admired Companies list  
(#6 on Metals list)

### Human Rights Campaign

Corporate Equality Index

### S&P Dow Jones

Sustainability Indices

### S&P Global Sustainability Yearbook

### S&P Global Platts

Industry Leadership Award,  
Mining and Raw Materials

## AUSTRALIA

### Workplace Gender Equality Agency

Employer of Choice for Gender Equality  
(20<sup>th</sup> consecutive year)

📍 Alcoa Australia

### Pride in Diversity/Australian Workplace Equality Index

Silver Tier Employer (9<sup>th</sup> consecutive  
year for either silver or bronze tier)

📍 Alcoa Australia

### 2022 Work Health and Safety Excellence Awards

Certificate of Merit for Best Solution  
to a Work Health and Safety Risk

📍 Willowdale Bauxite Mine

### Western Australian Training Awards

2022 Apprentice of the Year

📍 Megan Hazelden, Wagerup Refinery

### World Skills Australia Regional Competition

📍 Shayla Katona  
First place, Wagerup Refinery

📍 Jasper Bennett  
Second place, Pinjarra Refinery

📍 Marcus Busher  
Fourth place, Pinjarra Refinery

📍 Courtney Wragg  
Fourth place, Pinjarra Refinery

## BRAZIL

### Human Rights Campaign Foundation, Mais Diversidade and Forum de Empresas LGBTI+

Best Place to Work for LGBTQ+ People

📍 Alcoa Brazil

### Great Place to Work Brazil

Best Companies to Work for in  
Brazil 2022

📍 Alcoa Brazil

29<sup>th</sup> best large company in  
the country

📍 Poços de Caldas Operations  
Third best company in Minas  
Gerais region

📍 Alumar

Best company in Maranhão region

📍 Juruti Mine

Third best company in Norte region

## CANADA

### Salon Sur les Meilleures Pratiques D'Affaires (MPA)

Best Business Practices Show

📍 Aluminerie de Bécancour  
(Culture, Coup de cœur Jury Award)

📍 Aluminerie de Baie-Coemau  
(Digital, Coup de cœur Jury Award)

## NORWAY

### NHO Nordland

Business of the Month

📍 Alcoa Mosjøen