

Sustainability

Overview

Managing sustainability

We recognise that our commitment and progress in managing sustainability outcomes is vital to our business success and meeting the expectations of our stakeholders. We strive to deliver shareholder returns above our cost of capital through the cycle, while creating value for our customers, employees, suppliers and the communities in which we operate.

We strive to position Boral to sustainably create value for all our stakeholders by:

- delivering innovative, superior performing and more sustainable products and solutions that respond to a changing world and better meet our customers' needs
- driving safety performance towards world's best practice and investing in our people to enable them to deliver on our strategy
- reducing our environmental footprint and building our resilience to climate impacts, and
- being a socially responsible member of the communities in which we operate.

We monitor and report on our sustainability performance to drive progress and continuous improvement and are responding to increasing expectations of our stakeholders on the disclosure of our sustainability risks and opportunities. We are progressively adopting the recommendations of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD) and are strengthening our approach to managing and reporting on modern slavery risks in our operations and supply chain.

In FY2019, we will review the United Nations Sustainable Development Goals (SDGs) with a view to identifying those SDGs that we can materially impact within our sphere of influence, and incorporate these in our sustainability management approach and reporting

Sustainability governance

Sustainability governance is embedded in how we govern. Our approach is underpinned by an effective governance structure, constructive and open engagement with our stakeholders, and transparent reporting on our material issues.

The Board maintains oversight of sustainability matters, including identification of material issues and external reporting. The Board Health, Safety & Environment (HSE) Committee provides focused leadership, support and oversight of the activities of management.

The CEO & Managing Director is accountable for the management of sustainability issues and delegates this responsibility to Boral's Executive Committee. Day-to-day responsibility for sustainability rests with line managers and is embedded into Boral's Group and business-level strategies.

Managing sustainability, including safety, is considered an integral component of leadership and is linked to employment and considered in reviewing performance and setting fixed remuneration increases. We therefore do not link remuneration incentives with safety performance or other sustainability metrics.

During the year, the Board reviewed whether Boral's separation of safety and remuneration incentives remained appropriate, and concluded that it remains a very important element of Boral's culture to avoid linking incentive payments with safety outcomes. The Board retains discretion to adjust executive remuneration outcomes if there is evidence of a breakdown in management oversight and processes leading to poor safety outcomes. Further explanation of the safety and remuneration review is provided on page 62 of the Annual Report 2018.

Boral's governance approach is further detailed in the Annual Report 2018 (pages 34–47). Our governance of climate-related impacts is outlined on page 25.

Materiality

A biennial materiality assessment is undertaken to review sustainability risks and opportunities, which forms part of our broader risk management processes. This materiality assessment ensures that issues that are important to our long-term success, as well as to our employees, customers, suppliers and the communities in which we operate, are being addressed and transparently reported on.

In 2017, we engaged Ernst & Young (EY) to undertake a materiality assessment to validate our areas of focus. The scope of this work encompassed internal stakeholder interviews, desktop peer and media analysis, external industry and sector analysis, and consideration of relevant sustainability trends.

The results from EY's assessment were materially consistent with existing areas of management focus, and the outcomes of risk assessment processes. Refer to pages in this Annual Report (AR) and Boral Review 2018 (BR) for the issues identified as material:

- business conduct (AR p. 21, BR p. 17)
- diversity and inclusion (AR p. 22, BR p. 19)
- workplace relations and human rights (AR p. 22–23, BR p. 19)
- health and safety (AR pp. 23–24, BR pp. 20–25)
- climate-related impacts (AR pp. 25–28, BR pp. 26–32)
- environmental and community impacts (AR pp. 28–30, BR pp. 33–35)
- supply chain (AR p. 30, BR pp. 36–37)
- product innovation (AR p. 31, BR pp. 37–38)

Approach to reporting

Boral's 2018 Sustainability Report, which forms part of the Boral Review 2018, provides detailed information on the sustainability issues assessed as material to Boral. In addition to our Sustainability Report, we provide this sustainability overview in this Annual Report, and also communicate with our stakeholders on aspects of sustainability through:

- the Corporate Governance Statement and Directors' Report (including the Remuneration Report) in this Annual Report
- our website, which includes detailed energy, carbon and other emissions data, policies, information on sustainable products and community engagement programs
- case studies and features in our Boral News magazine – see boral.com/boral_news
- Boral's 2018 public report, lodged with the Workplace Gender Equality Agency.

This sustainability overview covers Boral's wholly owned operations and joint ventures that were at least 50% owned by Boral for the year ended 30 June 2018, unless otherwise stated. Sustainability data for Headwaters, acquired in May 2017, has been consolidated from 1 July 2017.

We engaged EY to provide independent assurance of selected metrics and related information including:

- Scope 1 and 2 greenhouse gas emissions and energy consumption by fuel source for our Australian operations
- significant environmental infringements and penalties
- lost time injury frequency rate (LTIFR)
- recordable injury frequency rate (RIFR)
- workforce statistics by occupation, age and length of service
- female representation by position.

EY's assurance statement is on page 52 of the Boral Review 2018.

Business conduct

Working with integrity, respect and fairness is fundamental to how we do business. We expect all employees and people representing Boral to meet the highest ethical standards as well as observing both the letter and spirit of the law.

Demonstrating strong ethical principles in all that we do is vital to our reputation and our ability to deliver long-term value to all of our stakeholders, including shareholders, customers, employees and communities.

Our Code of Business Conduct (Code) and supporting policies set out the high ethical standards we expect everyone across our international operations to adhere to, including third parties with whom we do business – suppliers, contractors and distributors.

Our commitment to anti-corruption compliance is reflected in our Code, which prohibits bribery and corruption in all forms, whether direct or indirect. Our anti-corruption measures include clear policies, accountability, training, reporting and audit review. Conduct risk and corruption risk are also assessed through our enterprise risk management review process.

We complement our policy and risk management framework with clear communication and training on the Code and associated policies in our induction training and ongoing refresher training programs. The USG Boral joint venture conducts additional risk-based anti-corruption training and has established an externally managed anti-corruption audit program.

The Board and senior management take breaches of the Code or other misconduct very seriously. We have consistent and transparent policies and practices in place to address any non-compliance with our Code and supporting policies. Formal consequences include additional training, impact on reward and promotion, formal warnings and termination. In FY2018, 35 employees in Boral Australia and Boral North America were dismissed for breach of policy or misconduct, including breaching safety requirements. These matters were considered isolated incidents and not systemic.

We provide easy and clear avenues for our people to report ethical concerns and improper behaviour. In addition to internal reporting channels – via senior management, human resources, internal audit and legal – we provide an external independent whistleblowing service, known as FairCall. Reports via FairCall can be made on an anonymous basis, and we are committed to maintaining the independence, impartiality and confidentiality of the reporting and investigative processes. The Company Secretary reports on these matters to the Board Audit & Risk Committee.

Boral's policies prohibit political donations or affiliations.

Industry associations

We work with a number of industry associations for various reasons including as a conduit to industry best practice, for workforce relations advice, or to advocate to government and the community on behalf of industry.

In general, the policy positions of our industry associations are to support regulation in the national and industry interest and encourage business to sustainably prosper and remain competitive.

We recognise that our associations represent the interests of many members and there may be some areas of policy that do not fully align with Boral's positions. When appropriate, we work with our industry associations to help them understand our Company's position.

In relation to energy and climate policy, we have not identified any major positions held by our industry associations that are materially inconsistent with Boral's position.

Further information is available at boral.com/industry_associations.

Our people

Building an engaged, diverse and capable workforce, led by talented and effective leaders, is vital to delivering long-term sustainable value for our stakeholders.

Workforce profile

As at 30 June 2018, we had 17,131 full-time equivalent employees including in joint ventures (JVs), and approximately 8,700 contractors working in 17 countries.

Full-time equivalent	FY2018	FY2017	FY2016
Boral employees	11,898	11,499 ¹	8,334
Boral contractors	~5,200	~4,800	~4,800
JV employees ²	5,233	4,976	3,724
JV contractors ²	~3,500	~3,400	~3,400

1. Included 4,016 full-time equivalent employees from Headwaters and excluded employees from Boral Bricks in North America which were included in JV employees.
2. Includes USG Boral, Meridian Brick and other small Australian-based joint ventures.

At end FY2018	Boral total	Boral Australia ³	USG Boral ³	Boral North America ⁴
Women in Boral	18%	14%	18%	23%
Average length of service	8.1 yrs	9.0 yrs	9.3 yrs	6.8 yrs
Average age	43.4 yrs	44.9 yrs	40.7 yrs	43.3 yrs
20+ year veterans	12%	13%	15%	9%
Employee turnover for FY2018	20%	17%	8%	29% ⁵

3. Excluding joint ventures.
4. Including Meridian Brick joint venture.
5. Reflects consolidation of Headwaters and Boral's legacy businesses. Compares to a FY2017 proforma employee turnover of 24%.

Diversity and inclusion

A diverse workforce helps us deliver higher performance by fostering a more creative, flexible and innovative culture by bringing together diversity of thought, background and experiences. It also enables us to better understand and serve our customers through reflecting the diversity of our communities.

We have an established Diversity and Inclusion Plan, with Boral's Diversity Council supporting the delivery of targeted outcomes. The Plan incorporates six elements: leadership, communication and education, system and process design, gender equality and pay equity, generational diversity, and Indigenous relations.

Focus areas in FY2018 included: raising awareness of the impact of unconscious bias, increasing representation of women, particularly in leadership roles, and pay equity outcomes, with the female to male average base salary ratio⁶ in Boral Australia favourable at 1.01:1.00.

We support Aboriginal and Torres Strait Islander employment, programs and communities. In FY2018, we continued to retain approximately 85% of Indigenous employees in Australia through our Indigenous employment program.

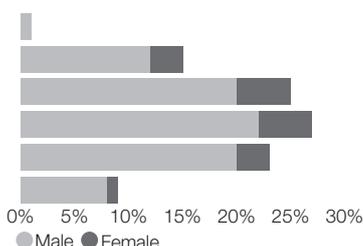
Our 2019 REFLECT Reconciliation Action Plan, which has been submitted to Reconciliation Australia, extends and broadens our existing approach. The Plan outlines practical actions aimed at strengthening relationships, respect and opportunities for Indigenous communities. These practical actions include increasing the number of Aboriginal and Torres Strait Islander employees across our workforce, further building on the work undertaken through our Indigenous employment program since 2006.

Workplace relations and human rights

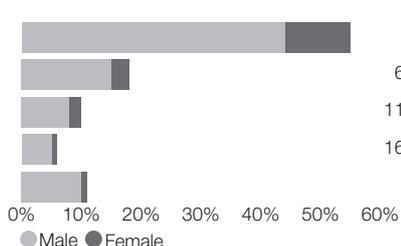
We are committed to advancing respect for, and promotion of, internationally recognised human rights across our global operations, as outlined in our Human Rights and Labour Policy. This includes contributing to the elimination of all forms of forced, compulsory or child labour and having workplaces free from harassment, bullying, discrimination and unlawfulness.

We support the rights of our employees to freedom of association, to choose to unionise and to collective representation, regardless of their location or function. We are committed to working honestly and transparently with labour unions and undertake negotiations in good faith. In Australia, we have some 79 enterprise agreements covering about 3,700 employees.

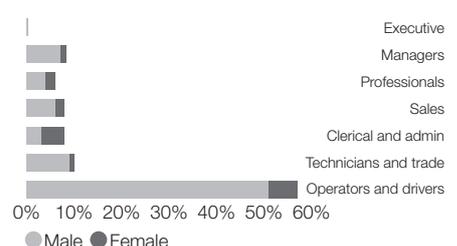
Age profile of employees (age)



Length of service of employees (years)



Employees by occupation



6. Calculated as the average base cash salary for females as a proportion of the average base cash salary for males, as used in the Workplace Gender Equality Agency Confidential Report.

Our grievance mechanisms are accessible, accountable and fair, enabling concerns to be raised without fear of recrimination. This includes Boral's independent external whistleblowing service, FairCall, where people can raise anonymous concerns.

In FY2018, we established a Human Rights and Modern Slavery Working Group to support work being undertaken to further develop our approach to modern slavery and human rights across our operations and supply chain. The working group, comprising members of Boral's Executive Committee and key functional roles, assessed Boral's approach to modern slavery in light of proposed Australian Government reporting criteria and the United Nations Guiding Principles on Business and Human Rights.

Key focus areas relating to our workforce for FY2019 include reviewing and enhancing Boral's Human Rights and Labour Policy and publishing it externally, refreshing our broader policy framework, and increasing awareness of modern slavery through targeted training.

Our approach to mitigating the risk of modern slavery in our supply chain is outlined on page 30.

Health, safety and environmental management

Our goal is to achieve Zero Harm Today. We strive to achieve this by identifying, understanding and eliminating conditions and behaviours that have potential to result in injury to people or harm the environment.

Where eliminating adverse environmental impacts is not possible, we aim to minimise any harmful effects from our operations, which means we typically target performance exceeding our environmental compliance requirements.

Our approach

Visible and proactive leadership, robust governance, accountability and effective frameworks and systems are all essential to driving a culture focused on our goal of Zero Harm Today.

Boral's CEO & Managing Director and senior executives regularly spend time at our operations, which provides an opportunity to discuss safety and environmental management challenges directly with site teams.

Divisional management teams and the corporate Health, Safety and Environment (HSE) function report on HSE performance, risks and management actions to the Board's HSE Committee on a quarterly basis and to Boral's Executive Committee on a monthly basis.

More serious HSE incidents, including near-miss events, are directly communicated to the CEO & Managing Director, with CEO-led incident review meetings held for serious HSE incidents (including near-miss events) involving relevant divisional executives, the Group HSE Director and local line management.

Divisional leadership teams are responsible for implementing divisional HSE strategies. Accountability and management of day-to-day HSE matters rests with line managers, with support from divisional HSE specialists who provide expert technical advice and coaching, and a small corporate HSE team. This team, headed by the Group HSE Director, is responsible for policy, governance and functional leadership, in consultation with divisional specialists.

HSE performance and actions are communicated at sites through forums including daily pre-start meetings, and at larger sites those meetings are supplemented with monthly HSE meetings.

HSE issues and risks are reviewed and assessed as part of due diligence processes on all potential acquisitions and, commensurate with HSE risks, new or expansion projects.

HSE strategy

Our priorities and approach to managing HSE are guided by four Group-wide strategic objectives and supported by 14 contributing programs.

Each division is responsible for implementing its own HSE strategies and improvement plans, consistent with Boral's Group-wide HSE strategy.

A summary of progress against our HSE objectives is provided on page 21 of the Boral Review 2018.

Safety outcomes

After nearly four years without a fatality, we deeply regret the death of a delivery driver at our Concrete operation in Alexandria, Sydney, in September 2017. A supplier's driver, delivering diesel to the site, died after he was struck by one of Boral's agitator vehicles on site.

Immediately following the incident, all sites were alerted, and vehicle and pedestrian management risks across all of our sites were considered. Boral Australia is also considering further risk mitigation measures such as introducing additional technology to monitor vehicle and pedestrian movements on-site.

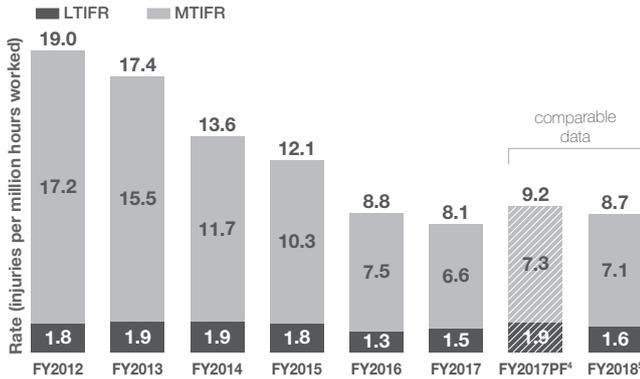
We are also saddened by the death of an off-duty contract employee at our Dutch Quality stone plant in Mt Eaton, Ohio in the US, who was killed in a two-vehicle collision on a public road outside our site in November 2017. While not work-related, it does not lessen the shared loss and our response to investigate and learn from this tragic incident.

To increase transparency, in FY2018 we commenced including all Group entities in our safety measures, irrespective of equity interest or management control. This compares to prior years when we included joint ventures where our equity interest was 50% or more. Consequently, we now include joint ventures within USG Boral.

FY2018 safety data also includes the Headwaters business, which when acquired in May 2017 was not as advanced in its safety journey as Boral.

After more than a decade of significant improvement in our safety data, FY2018 reported safety results broadly plateaued at relatively low levels largely due to the inclusion of new businesses, comprising over 4,500 employees and contractors.

Boral Group recordable injury frequency rate (RIFR^{1,2})



Our recordable injury frequency rate (RIFR^{1,2}) of 8.7 was modestly higher than 8.1 in FY2017, but a greater than 50% improvement from FY2012, and our lost time injury frequency rate (LTIFR¹) of 1.6 was broadly in line with 1.5 last year.

On a proforma basis, restating FY2017 data to include the additional businesses, our RIFR improved by 6% and our LTIFR by 16% in FY2018.

On a divisional level:

- Boral Australia reported a RIFR of 11.3, comparable to 11.2 in FY2017.
- Boral North America reported a RIFR of 8.9, an increase from 6.7 last year, reflecting the inclusion of Headwaters in FY2018. Boral North America’s legacy business RIFR was steady on last year at 6.7. The Headwaters business reported a RIFR of 10.7, a substantial improvement from 14.6 the prior year.
- USG Boral’s reported RIFR of 4.5 remains relatively strong, and this is the best performing division in Boral. This year’s result is softer than the 3.6 reported in FY2017 partially due to the inclusion of minority-owned joint ventures and partially due to a modest increase in injuries.

Boral’s overall Group RIFR on a comparable basis to prior years (excluding Headwaters and minority held joint ventures), was 8.4.

Percentage hours lost³, which monitors the severity of our more serious injuries by the total time lost, increased modestly from 0.04% in FY2017 to 0.05% in FY2018. Hours away on restricted or transferred duties³, a more holistic measure of the effect of all recordable injuries, improved to 0.18% from 0.22%. This suggests that injuries were generally less severe or responded better to treatment and return to work programs – a positive outcome for our injured people and the organisation.

Boral measures its safety performance for employees and contractors combined, which we believe is a true measure of performance. This can, however, make benchmarking challenging, as not all organisations report contractor data. In addition, Boral includes all entities irrespective of equity interest or management control, whereas other organisations typically include only entities in which they have management control.

While leading indicators tend to vary across our businesses, at a Group level we monitor hazard, near-miss and regulatory intervention reporting. In FY2018, hazards reported increased 19% to more than 91,000 while near-misses reported increased by 37% to more than 16,000 compared to the prior year.

Improving Headwaters’ safety performance

The acquisition of Headwaters in May 2017 more than doubled the size of our US-based workforce and nearly tripled our US operating sites, adding more than 4,000 employees across 170 operating sites.

While Boral North America’s legacy business and Headwaters were culturally well aligned and delivering improved safety outcomes in recent years, Headwaters’ injury performance was inferior to Boral’s.

Improving Headwaters’ safety performance has been at the forefront of our integration activities. We developed a focused improvement plan leveraging shared leading practices and prioritising high risk areas, and have embedded Boral’s Zero Harm Today goal through proactive leadership and safety training. In the initial months of ownership, we invested close to US\$10 million of capital to upgrade machinery guarding and other safety equipment at Headwaters’ sites.

In FY2018, Headwaters reported a RIFR of 10.7 and a LTIFR of 1.6 for employees and contractors, an impressive 27% and 59% improvement respectively over FY2017 RIFR and LTIFR of 14.6 and 3.9 for employees only. This compares to Boral North America’s legacy business, which reported a RIFR of 6.7 and a LTIFR of 0.8 in FY2018⁶.

1. Per million hours worked for employees and contractors in 100%-owned businesses including Headwaters, and all joint ventures businesses regardless of equity interest in FY2018. Prior years data only includes 50%-owned joint ventures and excludes Headwaters.
2. RIFR is the combined lost time injury frequency rate (LTIFR) and medical treatment injury frequency rate (MTIFR).
3. Defined as a percentage of total hours affected against total hours worked – for employees only.
4. Proforma. All entities, including Headwaters data prior to Boral acquisition, and joint ventures within USG Boral.
5. All entities, including full year Headwaters data, and joint ventures within USG Boral.
6. For employees and contractors, including the Meridian Brick joint venture.

Climate-related impacts

Climate-related impacts and the transition to a low carbon economy affect our operations, customers and supply chains.

We recognise that as a global manufacturer of construction and building products, we are a significant emitter of carbon, particularly through our clinker manufacturing operations in Australia, which account for 49% of our total emissions of 2.6 million tonnes of CO₂-e.

Since FY2012, we have reduced our absolute (Scope 1 and 2) greenhouse gas (GHG) emissions by 27% through actively re-aligning our portfolio towards lighter-weight products and less carbon-intensive businesses, reducing clinker manufacturing in Australia in favour of imports from larger scale, more modern and efficient operations in Asia¹, and investing in energy efficiency and alternative fuels programs.

We are committed to continuing to develop appropriate strategies to identify, manage and respond to climate-related risks and opportunities across our business. This encompasses building the resilience of our portfolio to climate impacts through adapting and responding to market, policy and technological changes by creating innovative solutions and products that support a smooth transition to a low carbon future.

We strive to provide transparent disclosure of those risks and opportunities, and how we manage and respond to climate impacts, to help investors and others understand our business. We are progressively adopting the recommendations of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD) to improve both our approach in assessing and managing climate-related risks and opportunities and our related external reporting.

Following engagement with numerous large investors and other stakeholders, we have incorporated key information previously included in our CDP Climate Change responses over the following pages, with further details available on pages 26–32 of the Boral Review 2018 and at boral.com/energy_and_emissions.

Governance

The full Board maintains oversight of Boral's response to climate-related risks and opportunities, including risk identification and management, strategy and external reporting. In addition, the Board HSE Committee is responsible for reviewing and monitoring the effectiveness of Boral's policies, systems and governance structure in identifying and managing HSE risks that are material to the Group, as well as compliance with legal and regulatory requirements associated with HSE matters. The Board HSE Committee considers energy and climate-related issues at each of its meetings.

1. Following the closure of Boral's clinker manufacturing plant at Waurn Ponds, Victoria, in 2013, clinker has been imported from Asia. The emissions intensity of our Waurn Ponds clinker manufacturing operations in FY2013 was 0.98 tonnes CO₂-e per tonne of production. The emissions intensity of our imported clinker, included as Scope 3 emissions, is 0.95 tonnes CO₂-e per tonne of production, including shipping to the Port of Geelong (a 3% reduction in emissions).

The Board Audit & Risk Committee is responsible for satisfying itself that a sound system of risk oversight and management exists and that internal controls are effective. It meets at least four times per year and receives an annual report on our organisation-wide risks, which include climate-related risks and opportunities. Further details of the roles and responsibilities of the Board HSE and Audit & Risk Committees are in the Corporate Governance Statement in this Annual Report.

While the full Board maintains oversight of Boral's climate-related risks, the CEO & Managing Director is accountable for the management of Boral's risks in relation to climate impacts and delegates responsibility to the Executive Committee.

The Executive Committee, which includes the CEO & Managing Director, is individually and collectively accountable for assessing and managing these risks. Divisional Chief Executives and the Group HSE Director have specific responsibilities in respect of climate-related risks and opportunities.

Strategy

Boral acknowledges the physical and financial risks associated with climate-related impacts and the potential impact on our business from a global transition to lower carbon energy sources.

Such a global transition may impact our business through the pricing of energy, the availability of raw materials such as clinker, gypsum and fly ash, and construction industry standards and customer preferences for lower carbon solutions, which present both risks and opportunities.

Boral's key transition and physical climate-related risks include:

- increased energy costs from changes in carbon or energy policy
- potential reduction in fly ash supply in North America as coal-fired power utilities curtail over time
- supply chain impacts from closures of energy-intensive manufacturing facilities due to changes in environmental policy
- demand shifts towards low carbon construction materials resulting from changes in construction industry standards and regulations and shifts in consumer preferences
- increased severity of extreme weather events
- changes in precipitation patterns and unseasonal weather variability.

Boral's climate-related opportunities include:

- capturing growth opportunities from a transition to a lower carbon economy through product innovation and increasing substitution of cement with fly ash in the manufacture of concrete
- reduced energy costs through energy efficiency initiatives and alternative fuels use in cement manufacturing
- using Boral Timber residue by-products as biofuel.

Further details of these climate-related risks and opportunities are provided on pages 28–29 of the Boral Review 2018.

As part of our business strategy, we have been reducing our exposure to high fixed cost, energy- and emissions-intensive operations.

We have been growing through shifting our portfolio to lighter-weight building products that have more scalable manufacturing and more variable costs, and are less energy-intensive to produce.

We have been closing cement manufacturing kilns and exiting the bricks business, which has underpinned reductions in our absolute GHG emissions and emissions intensity of 27% and 44% respectively over the past six years.

This repositioning of the business has both reduced Boral's risks associated with the transition to a lower carbon economy and our exposure to energy costs. In FY2018, total energy and fuel costs accounted for around 7% of Boral's cost base¹.

With cement being highly emissions-intensive and an important input into downstream concrete production and in some building products, we are continuing to look at ways to reduce future cement-related carbon emissions. In FY2018, our Cement business accounted for 59% of Boral's GHG emissions. Details of how our alternative fuels project at Berrima Cement Works is reducing carbon emissions is detailed on page 30 of the Boral Review 2018.

More broadly, we continue to focus on energy efficiency improvements, and the use of waste materials and biofuel development to reduce our own operational emissions.

Within our supply chain, the biggest role Boral is likely to play in reducing GHG emissions is by increasing the use of fly ash as a cement substitute in the ready mix concrete industry in the US, where Boral is the largest broker of fly ash.

The World Business Council for Sustainable Development Cement Sustainability Initiative² identifies a reduction of the clinker to cement ratio through the use of alternative cementitious materials such as fly ash and slag as an important key mitigation lever in reducing carbon emissions associated with cement production. Substituting cement with fly ash during ready mix concrete production achieves the same result.

A case study outlining how we plan to leverage our Fly Ash business to reduce carbon emissions is provided on page 29 of the Boral Review 2018.

To gain a better understanding of the potential climate-related transition risks and opportunities, Boral's Cement business has commenced scenario analysis work focused on clinker production and imports. Three climate scenarios have been developed, and these are informing the development of appropriate response strategies to potential climate transition risks. This includes two-degree scenarios as recommended by the TCFD and consistent with Paris Agreement temperature targets. This work is currently being completed and reviewed internally. Further information on the scenario analysis work is provided on page 32 of the Boral Review 2018.

1. Includes cost base of USG Boral and Meridian Brick joint ventures which are equity accounted.

2. World Business Council for Sustainable Development, Cement Sustainability Initiative, <https://www.wbcscement.org>

Risk management

Climate-related risks are incorporated into Boral's risk identification and management process, which includes a formal bottom-up, organisation-wide risk management process undertaken on a yearly basis. This process is managed by Group Risk & Internal Audit. A summary of Boral's risks and responses, including climate-related risks, is included on pages 18–19.

To supplement the annual risk review process, in 2017, a targeted Climate-related Risks and Opportunities Strategic Review was undertaken across Boral's businesses using the recommended framework set out by the TCFD. This process identified more specific climate-related risks and opportunities which are included in the Boral Review on pages 28–29. The outcomes of this review were presented to the Board HSE Committee.

Sustainability risks are embedded into Group and business-level strategies.

Metrics and targets

Our Scope 1 and 2 emissions have reduced by 27% since FY2012 to 2.6 million tonnes of CO₂-e^{3,4}.

Our emissions intensity has reduced by 44% since FY2012 to 375 tonnes of CO₂-e per A\$ million of revenue^{3,4,5}.

Our climate-related goals and targets are to:

- reduce emissions intensity by a further 10–20% by 2023
- reduce CO₂-e emissions in our supply chain by 1.1–1.5 million tonnes through increased fly ash supply by 2022⁷
- deliver annual growth in the share of revenue from low carbon, high-recycled products, which accounted for 9% of Group revenue in FY2018.

Our low carbon and high-recycled content products and businesses include Boral North America Fly Ash and TrueExterior® Siding & Trim, and in Boral Australia, ENVISIA® concrete, WarmPave and Boral Recycling.

Our approach to reducing emissions

We are confident that Boral's emissions intensity will continue to reduce over the coming years, as we know that our future will be focused on less emissions-intensive operations than our past, and we continue to reduce emissions through efficiency programs and product development. At times, however, our absolute emissions may increase as production increases to meet demand and through acquisition, as was the case in FY2018.

We have an emissions-intensive cement manufacturing plant at Berrima accounting for ~60% of Boral's total emissions, and a bricks business in Western Australia and bricks joint venture in the USA together accounting for ~10% of our emissions.

We have no intention to invest in new cement or brick kilns, and these manufacturing operations are unlikely to be in Boral's portfolio in the long-term, which would result in our Scope 1 and 2 emissions reducing by around 70%. However, we cannot put targeted dates around the life of these operations, which will be determined by economic drivers.

Over the next five years, we are aiming to further reduce the emissions intensity of our operations by 10%–20%, delivering a total emissions intensity reduction of 50–55% since FY2012. This targeted trajectory reflects higher expected growth in our less energy- and emissions-intensive businesses in North America and Asia relative to our more mature business in Australia. It does not capture the potential exit of non-core brick operations, other divestments or possible acquisitions.

The 27% reduction in Boral's absolute GHG emissions over the past six years reflects our portfolio re-alignment towards less emissions-intensive operations through divestments and plant closures, the shift to imported clinker and our investment in more energy efficient technologies and alternative fuels programs.

Boral Australia, as part of its divisional sustainability strategy, is establishing aspirational goals and targets regarding energy efficiency improvements and renewable energy.

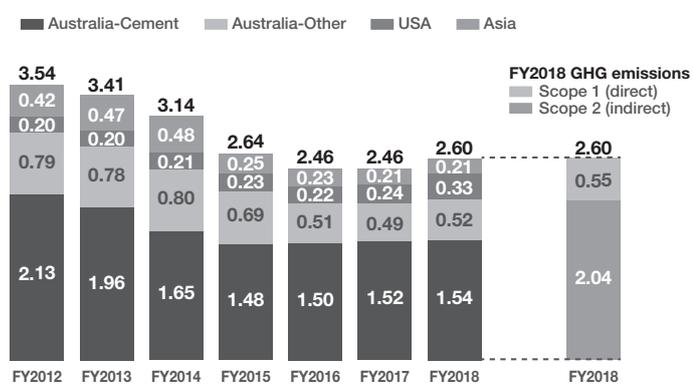
Greenhouse gas emissions

In FY2018, Boral's absolute (Scope 1 and 2) emissions of 2.6 million tonnes of CO₂-e increased by 5% compared to the prior year, reflecting the inclusion of the acquired Headwaters business in North America and modestly higher emissions from Boral Australia and USG Boral^{3,4}.

In line with our strategy, Boral's emissions intensity reduced by 23% to 375 tonnes of CO₂-e per A\$ million of revenue, with the acquired Headwaters businesses being substantially less energy- and carbon-intensive than our traditional businesses^{3,4,5}.

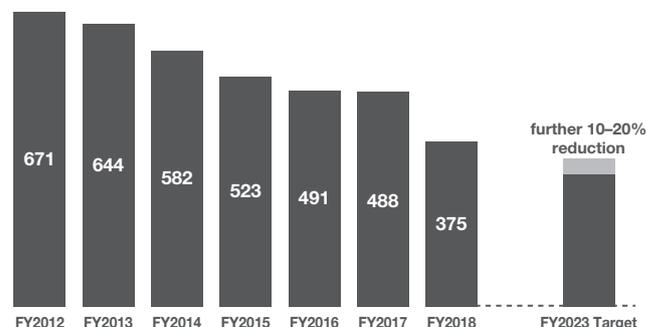
Absolute emissions were up 1% in Cement, 5% higher in the remainder of the Australian operations, 1% higher in Asia and up 35% in the US. The substantial increase in US emissions reflects the inclusion of Headwaters, as well as underlying growth in production volumes driven by stronger demand. The modestly higher emissions in Australia and Asia reflect overall higher activity levels driven by stronger demand across both regions.

GHG emissions from operations^{3,4,6} (million tonnes CO₂-e)

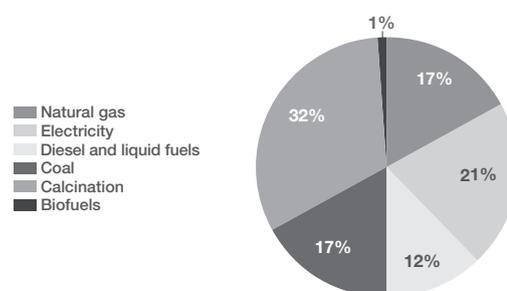


- Data provided for GHG emissions and energy consumption is for 100%-owned operations and Boral's share of 50%-owned joint venture operations – it excludes some joint ventures which in aggregate are not deemed to have material emissions.
- USG Boral Asia emissions data for FY2017 has been restated using local electricity emissions factors where available.
- Group reported revenue adjusted to include 50% share of underlying revenues from USG Boral and Meridian Brick joint ventures, which are equity accounted.

GHG emissions intensity from operations^{3,4,5} (tonnes CO₂-e per A\$m revenue)



GHG emissions by source³



This year, we focused on improving data collection of our Scope 3 emissions to more reliably report on our most material indirect emissions. While we have further work to do in collecting carbon information from suppliers, early indications suggest our key Scope 3 emissions which relate to clinker imported into Australia by Boral Cement and the purchase of cement in our US building products businesses (Stone, Roofing, Block) are in the order of 1.2 million tonnes per annum.

Looking more broadly at the role Boral plays in the supply chain, our FY2018 fly ash sales in North America resulted in ~5.2 million tonnes of avoided CO₂-e per annum⁸, resulting in a net Scope 3 positive impact of 4.0 million tonnes of CO₂-e per annum for these cementitious materials.

With plans to increase available annual supply of fly ash by 1.5–2.0 million tons over the next three years, we are targeting a further reduction of 1.1–1.5 million tonnes of CO₂-e in the supply chain by 2022.

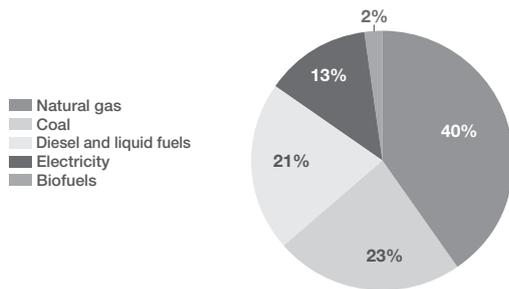
Definitions of Scope 1, 2 and 3 emissions are included on page 53 of the Boral Review 2018.

- Figures may not add due to rounding.
- Based on increasing available supply of fly ash by 1.5–2.0 million tons (1.4–1.8 million tonnes) per annum over the next three years. Refer to case study "Leveraging our Fly Ash business to reduce carbon emissions" on page 29 of the Boral Review 2018.
- We have used a conservative conversion factor to estimate CO₂-e emissions displaced as a result of fly ash substitution of cement in ready mix concrete, assuming that for every one tonne of fly ash approximately 0.8 tonne of CO₂-e is displaced. This conversion rate accounts for varying qualities of fly ash, and therefore substitution rates of 1.25 tonnes of fly ash per tonne of cement in ready mix concrete and assumes one tonne of cement produced results in one tonne of carbon emissions.

Energy consumption

In FY2018, our operations consumed 22 petajoules of energy¹, up 7% on last year, reflecting the acquisition of Headwaters and increased production volumes across our three divisions. Boral's Cement operations accounted for 31% of the Group's energy consumption.

Energy by fuel source^{1,2}



Further data on Boral's energy consumption, GHG and other emissions can be found at boral.com/energy_and_emissions.

Environmental and community impacts

Our policy is to eliminate adverse environmental impacts and where elimination is not possible, seek to minimise any harmful effects from our operations.

At an absolute minimum, this means complying with environmental legislation, regulations, standards and codes of practice applicable to each of our businesses.

We recognise that effective management of our sites, including complying with our site-based planning approvals, is critical to our reputation and meeting community expectations.

We manage our quarries and land assets responsibly, planning strategically to mitigate and manage our impacts across the full life cycle of our extraction and processing sites – from development applications through to rehabilitation and end-use planning and development.

We are also committed to meeting our responsibilities to the local communities in which we operate. This means managing our operations to avoid negative impacts on local stakeholders and proactively addressing community concerns through open and constructive engagement programs. Operational issues that can impact local communities include traffic, noise, dust, odours, water, waste, quarry end use, and impacts on biodiversity, heritage and culture.

Community engagement

Our stakeholder engagement programs are underpinned by ongoing communications, consultation and contribution to the local community.

At key sites we have Community Consultation Committees that include elected community representatives which meet with interested residents and stakeholders. We communicate through online information resources, newsletters, mail, advertising, community inspections, community meetings and site tours.

For example, during the year, we held guided tours for the community at our Hall, Talbragar and Seaham quarries in NSW and Orange Grove and Midland Brick quarries in Western Australia. This provides an opportunity for the public to understand our operations, and for Boral to receive feedback on any issues, including our impact on local communities. Government representatives also participated in site tours around our concrete and quarry operations on the Gold Coast, Queensland.

We have been acknowledged as an industry leader in community engagement. This year, we received the Community Leadership Award at the NSW Cement Concrete & Aggregates Australia 2017 Innovation Awards. The award recognised Boral's comprehensive stakeholder engagement program at Marulan that uses feedback from local residents to guide community relations plans, incorporates public reporting on commitments, and is focused on actively contributing to the local community through initiating and organising local events.

Environmental compliance

We target zero environmental infringements across our ~680 operating sites and strive to continuously improve our environmental management and performance.

We continue to strengthen our internal controls to improve compliance with increasingly stringent regulatory requirements in Australia, including through an online information management system for environmental licence conditions.

During the year, we conducted 55 environmental compliance audits, developed 89 new site-based action plans and reviewed 246 existing site-based action plans for effectiveness across our Australian operations. Boral North America completed 29 environmental compliance audits, focusing on operations acquired through Headwaters.

Formal regulatory notifications are reviewed by our internal legal and HSE functions and reported to Boral's Executive Committee. Any material issues are reported to the Board HSE Committee, even if no penalty results.

In FY2018, we were charged with six regulatory infringements related to environmental contraventions in Australia and the US that resulted in total fines of \$82,273. The number of infringements and fines is significantly lower than in the prior year despite our substantially enlarged footprint following the acquisition of Headwaters, reflecting an increased focus on compliance.

1. Data provided for energy consumption is for 100%-owned operations and Boral's share of 50%-owned joint venture operations – it excludes some joint ventures which are in aggregate not deemed to be material.
2. Figures do not add to 100% due to rounding.

The infringements relate to non-compliant:

- water quality discharge from the Chinderah concrete plant, NSW
- supply of concrete outside of approval conditions from the Mount Kuring-gai concrete plant, NSW
- use of kiln exhaust at Meridian Bricks JV Salisbury plant, North Carolina
- disposal of solvent wastes at Atlantic Shutters Latta plant, South Carolina
- disposal of solid or viscous materials to sewer at Oceanside roofing plant, California
- permitting of a raw material feed and gas flare at Meridian Bricks JV Terre Haute plant, Indiana.

In addition, we have one set of agreed undertakings relating to vegetation clearing at the Loch Catherine Colliery in NSW.

In November 2016, the NSW Resources Regulator (Regulator) commenced investigations relating to the clearing of approximately one third of a hectare of vegetation regrowth along a pre-existing drift at the Loch Catherine Colliery, which the Regulator deemed to be undertaken without the relevant consent. The Loch Catherine Colliery is located on the same mining lease as Boral's Medway Colliery, although never operated by Boral. While Boral undertook this clearing as part of closure works and on the basis that we held the appropriate approvals, the Regulator deemed that Boral's activities were not permitted.

Boral entered into an enforceable undertaking in relation to this matter that was accepted by the Regulator in March 2018. The Regulator's published decision noted that Boral's actions were neither malicious nor in deliberate contravention of its regulatory obligations. Boral's obligations under this undertaking include training of relevant staff, conducting compliance audits and making a \$50,000 contribution to a conservation project managed by a not for profit organisation. Boral expects to incur approximately \$133,000 in complying with its obligations.

Infringements and penalties

	FY2018	FY2017	FY2016	FY2015
Number	6	10	9	3
Fines ¹	\$82,273	\$111,083	\$33,888	\$11,658
Penalties ¹	\$0	\$30,000	\$250,000	\$0
Undertakings	\$133,000	\$133,556	\$0	\$0

1. Fines are directly issued by the Regulator and penalties by a court hearing.

Biodiversity management

Protecting the diversity of plant and animal species at and around our operational sites is a core component of our land management efforts.

Some examples of the many initiatives to protect biodiversity at our own sites include:

- collaborating with the Royal Botanic Garden Sydney in research on the endangered Illawarra Socketwood population at our Dunmore Quarry in NSW
- partnering with Sleepy Burrows Wombat Sanctuary to capture and relocate wombats found at our Peppertree Quarry in NSW
- maintaining koala fodder plantations at Narangba and Petrie quarries in Queensland
- conservation work to provide habitat for the threatened legless lizard and spiny rice-flower at Deer Park Quarry in Victoria
- construction of a bird island habitat as part of our rehabilitation of wetlands at our Dunmore Quarry in NSW.

Through our community partnership with Conservation Volunteers Australia, we support conservation and education initiatives in our local communities, including native vegetation initiatives in local reserves and schools.

Cultural heritage

We are committed to protecting places and items of cultural significance to local Indigenous groups across our Australian operations. We work alongside Indigenous peoples to protect cultural heritage, including across our sites subject to Cultural Heritage Management Plans. Some of this work includes:

- engaging local Aboriginal groups to undertake cultural heritage surveys, including at 13 quarry sites in Queensland
- salvage excavation works at Peppertree Quarry in NSW which were completed in March 2018, with identification of nearly 100,000 Aboriginal artefacts.

Water management

Water is a valuable resource and good quality fresh water is essential to our concrete, construction material and plasterboard operations. We use water in manufacturing, and for dust suppression, cleaning and sanitation. Our quarry and asphalt operations are able to use recycled, brackish and/or process water.

Boral's global operations consumed about 4 gigalitres of municipal supplied water, steady on last year.

At our larger sites, including our quarry operations, we also capture rainfall or stream flow which is largely used for dust control purposes. In Boral Australia, we are developing systems that will enable us to collect data on captured rainfall and are developing plans that will underpin an overall improvement in water efficiency.

At a Group level, management of water is not considered a material risk. Individual Boral sites may, however, be exposed to water risk from time to time, either from too little or too much water, and we assess the potential impacts on our stakeholders of water-related risks where this is relevant.

Most of our Boral North America operations have federal or state government stormwater management permits with very stringent limits. To reduce the risk of non-compliance, we have been implementing a program of upgrading stormwater management infrastructure.

Across the Group, a relatively small amount of used process water is discharged to sewer for treatment by water authorities in line with our existing licensing conditions at relevant sites. We have well established internal compliance systems for prevention of pollution of discharged waters, as well as numerous regulatory controls through licensing and permitting.

In recent years, we have had several penalties regarding water discharges. These are largely traceable to rainfall deluge events, which we are moving to better respond to as part of our approach to climate-related risks.

When developing or purchasing new facilities, our due diligence assessment includes scenario analysis of the quantity and quality of water, assessment of the risks of potential water discharges, and, where relevant, river catchment assessments to ensure sufficient water availability and supply.

Waste and recycling

Throughout Boral's operations, some materials are commonly re-used back into our production processes, including concrete washout, recycled asphalt pavement (RAP), and plasterboard waste from production and building sites. This beneficially uses materials that would otherwise require disposal.

A large proportion of Boral's recycled and low carbon products revenue, totalling 9% of Group revenue, is derived from external waste products. This includes our Fly Ash and Boral Recycling businesses. Opportunities for the re-use of production by-products or waste material continue to grow and are actively being pursued.

In Boral Australia, we are developing plans and looking for opportunities that will help us firm up targets to reduce waste generated across all product lines over the coming five years.

Boral's businesses deal with only low amounts of hazardous waste, and this is managed in accordance with government regulations.

We only use relatively small amounts of packaging, as the vast majority of our products are delivered in bulk. Boral businesses in Australia that do use some packaging, such as Midland Brick, are signatories to the Australian Packaging Covenant. Boral Cement, through its membership of Cement Concrete & Aggregates Australia, is also a signatory.

Supply chain

We recognise that through the purchase of goods and services we indirectly impact the workers in our supply chain, their communities and the environment.

We expect our suppliers and contractors to uphold the same high ethical standards as our people and abide by Boral's Code of Business Conduct.

We have been revising our supply chain governance and policy framework in line with rapidly changing stakeholders' expectations and best practices. During the year, we introduced Boral's Sustainable Procurement Policy that aims to align our practices with the world's first International Standard for Sustainable Procurement ISO 20400 and sets out our minimum sustainability procurement requirements for purchasing goods and services across our supply chain.

Our Sustainable Procurement Policy outlines our commitment to recognising, assessing and managing modern slavery risk, promoting diversity and inclusion through partnerships with social enterprise businesses, and requires suppliers to comply with our Supplier Code of Conduct and Indigenous Procurement Policy.

We monitor supply chain risks by assessing suppliers' performance and their alignment to Boral standards through a pre-qualification questionnaire and evaluation processes. In Australia and USG Boral, a sanction screening process is used to identify any areas of risk by association with elements such as financial crime, fraud, and human rights abuse. In Australia, we engage a third-party service to register and monitor compliance of suppliers to our pre-qualification requirements.

Our Supplier Code of Conduct requires suppliers to adhere to minimum standards relating to health and safety, environment and labour, including prohibiting the use of child labour and complying with applicable modern slavery legislation.

We are committed to combating modern slavery in society and strengthening our approach to most effectively identify and address this risk across our supply chain. While we have not identified any evidence of modern slavery in our supply chain, we continue to refine our approach in light of proposed Australian Government modern slavery legislation.

We established a Human Rights and Modern Slavery Executive Working Group, composed of members of Boral's Executive Management team and key functional roles, to support this work, including defining planned actions for FY2019.

Our Sustainable Procurement Policy and Supplier Code of Conduct issued during the year strengthened our policy framework, directly addressing the risk of modern slavery in our supply chain. We are also collaborating with global peers to ensure our approach reflects industry best practice.

Further details are provided on pages 36–37 of the Boral Review 2018.

Product innovation

As building material technologies and consumer preferences continually change, we have a critical part to play in delivering more effective and sustainable solutions to building the homes and cities of tomorrow. We actively work to better meet the needs of customers, support their objectives and deliver more sustainable product solutions

We use external waste and by-products or secondary resources in a range of our products. Our North American Fly Ash business uses a coal combustion by-product to provide building products manufacturers low carbon cost-effective alternatives to conventional materials which offer significant performance advantages.

Boral TrueExterior® Siding & Trim products comprise up to 70% fly ash and deliver durability and workability advantages to alternative products.

Boral Recycling is one of the largest construction and demolition materials recyclers in NSW, processing more than one million tonnes annually of concrete, asphalt and bricks from demolitions, recycling centres and concrete batch plants. Achieving more than 99% resource recovery rates, our products include recycled roadbase, aggregate and manufactured sand products.

We collaborate with our customers to strive to meet their sustainability goals. For example, during FY2018, we supplied low carbon concrete, ENVISIA®, to meet the Green Building Council of Australia's Green Star specification requirements of Crown Sydney at Barangaroo, rated Green Star 3, and Darling Harbour Live, rated Green Star 2.

We are currently piloting USG-developed Sheetrock® EcoSmart Panels at our Pinkenba plasterboard plant in Queensland. EcoSmart Panels are lighter weight with stronger sag performance and deliver improved sustainability attributes with 25% less water and 20% fewer carbon emissions used in manufacturing. We are also developing safer, improved construction methods in Asia, including through USG Boral's EasyFinish™ System.

During the year, we invested A\$17 million in R&D across our three innovation centres in the USA, Australia and Thailand. Our R&D teams are helping Boral deliver superior building product solutions and disruptive innovations in building materials to better serve our customers and develop new markets.

Further details of Boral's product innovation are provided on pages 37–38 of the Boral Review 2018.

Community investment

Our community investment program is built on a long and proud history of supporting the communities in which we operate and aims to make a positive and sustainable contribution to the wellbeing of those communities.

We support community groups and organisations that share our values and where our resources can make the most impact in addressing their needs and priorities.

With this in mind, we have built a community investment framework around three pillars, Our People, Places and Products. This framework helps us identify and evaluate opportunities to build a robust and effective community investment program that delivers measurable benefits to our communities and Boral's people and businesses.

In early FY2018, we reviewed our approach to community partnerships, incorporating input from a range of internal and external stakeholders. The review found that our overarching strategic framework works effectively and resonates well with our people, but we have now more clearly defined the three pillars, improved guidance to better support decision making at the corporate and business level, and improved our approach to measuring outcomes beyond our financial contribution.

We have 12 corporate community partnerships, in addition to providing financial support to local community causes and projects. In FY2018, we contributed a total of \$1,092,000 to our community partnerships and local community causes and projects, comprising \$886,000 in cash, \$121,000 in materials and \$85,000 in fundraising and events.

Our funding supports:

- Bangarra Dance Theatre
- Conservation Volunteers Australia
- Habitat for Humanity
- HomeAid America
- Outward Bound Australia
- Redkite
- Taronga Conservation Society
- Touched by Olivia
- Great Barrier Reef Foundation
- Anzac Centenary Public Fund
- University of NSW (Women in Engineering Scholarships)
- University of Sydney (US Studies Centre – research program)

We are also preparing to launch a new partnership in FY2019 with Road Safety Education Limited to support road safety education for youth throughout Australia.

More information on our partnerships can be found at boral.com/community_investment.