

Emissions and energy

Carbon emissions and energy consumption data below excludes some joint ventures, which in aggregate, are not deemed to have material emissions

Definitions of Scope 1, 2 and 3 emissions are included on page 61 of the 2020 Boral Review & Sustainability Report.

Note: data may not add due to rounding

	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Carbon emissions (k tonnes CO ₂ -e)						
Scope 1 and 2						
Scope 1	2,076	1,926	1,970	2,044	1,895	1,742
Scope 2	567	532	495	552	517	481
TOTAL	2,643	2,458	2,465	2,595	2,412	2,224
Scope 1 under emissions-limiting regulations	0%	0%	62%	58%	57%	57%
Scope 3¹						
Clinker imported by Cement business				~800		
Cement purchased by Boral North America				~400		
Boral Australia					1,955	1,822
Boral North America					869	873
USG Boral – 50% interest					365	454
TOTAL				~1,200	3,189	3,149
By region – Scope 1 and 2						
Australia	2,168	2,003	2,010	2,055	1,911	1,781
North America	228	223	243	326	300	259
Asia	247	232	212	214	201	183
TOTAL	2,643	2,458	2,465	2,595	2,412	2,224
By business – Scope 1 and 2						
Cement	1,477	1,496	1,519	1,540	1,415	1,318
Construction Materials	407	322	332	358	348	333
Building Products ³	224	126	97	92	84	73
Boral Australia	2,109	1,943	1,948	1,990	1,847	1,724
Boral North America	228	223	243	326	300	259
Gypsum/USG Boral – Australia ⁴	59	60	62	66	64	57
Gypsum/USG Boral – Asia ^{4,5}	247	232	212	214	201	183
Gypsum/USG Boral	306	291	274	279	265	240
TOTAL	2,643	2,458	2,465	2,595	2,412	2,224
Scope 1						
Cement	1,267	1,289	1,304	1,317	1,203	1,124
Construction Materials	300	208	232	242	242	234
Building Products ³	153	81	63	58	53	45
Boral Australia	1,720	1,578	1,599	1,616	1,498	1,403
Boral North America	151	155	173	227	207	168
Gypsum/USG Boral – Australia ⁴	38	40	41	43	42	37
Gypsum/USG Boral – Asia ⁴	166	153	157	158	149	134
Gypsum/USG Boral	204	193	198	201	191	171
TOTAL	2,076	1,926	1,970	2,044	1,895	1,742
Scope 2						
Cement	210	207	215	223	213	194
Construction Materials	108	113	99	117	105	99
Building Products ³	71	45	35	34	31	28
Boral Australia	389	365	349	374	350	321
Boral North America	76	68	70	100	94	91
Gypsum/USG Boral – Australia ⁴	21	20	22	22	22	20
Gypsum/USG Boral – Asia ^{4,5}	81	78	54	56	52	49
Gypsum/USG Boral	102	99	76	78	74	69
TOTAL	567	532	495	552	517	481

Emissions and energy (continued)

	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Boral Cement						
Alternate fuel usage (% of thermal energy) – clinker					9%	10%
Alternative fuel use / rate as % energy consumption – cement					8%	9%
Carbon emissions (k tonnes CO₂-e)						
Scope 3 – by category						
Purchased goods and services						65%
Downstream transportation						17%
Upstream transportation and distribution						11%
Fuel- and energy-related activities not included in Scope 1 and Scope 2						7%
Business travel						0%
TOTAL						100%
Scope 1 and 2 – By source						
Natural Gas			454	443	422	377
Electricity			495	552	517	481
Diesel and liquid fuels			268	324	314	299
Coal			431	444	380	358
Calcination			817	819	763	704
Biofuels			0	13	15	4
TOTAL			2,465	2,595	2,412	2,223
Emissions intensity⁶ (tonnes of CO ₂ -e per A\$m revenue)						
Scope 1	411	384	390	295	274	258
Scope 2	112	106	98	80	75	71
TOTAL	523	491	488	375	348	329
Adjusted Group revenue – A\$m ⁶	5,049	5,010	5,055	6,916	6,928	6,765
Energy consumption (petajoules)						
Boral Group						
Natural Gas	11.4	9.9	8.7	8.7	8.2	7.4
Electricity	2.5	2.4	2.4	2.8	2.7	2.6
Diesel and liquid fuels	2.9	3.3	3.8	4.6	4.5	4.3
Coal	4.7	4.8	4.8	4.9	4.2	4.0
Renewable	-	-	0.3	0.5	0.7	0.7
Alternative	0.6	-	0.1	0.1	0.3	0.3
TOTAL	22.1	20.3	20.1	21.6	20.6	19.2
% grid electricity	11%	12%	12%	13%	13%	13%
% alternative	3%	0%	1%	0%	1%	1%
% renewable	0%	0%	2%	2%	4%	4%
By division						
Boral Australia (excluding Cement)						
Natural Gas			1.6	1.5	1.4	1.3
Electricity			0.6	0.7	0.6	0.6
Diesel and liquid fuels			3.0	3.2	3.2	3.1
Coal			0.0	0.0	0.0	0.0
Renewable			0.1	0.4	0.4	0.4
Alternative			-	-	-	-
TOTAL			5.3	5.7	5.6	5.3

Emissions and energy (continued)

	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Energy consumption (petajoules)						
Cement business						
Natural Gas			0.7	0.6	0.7	0.8
Electricity			0.9	0.9	0.9	0.8
Diesel and liquid fuels			0.3	0.3	0.3	0.3
Coal			4.7	4.9	4.2	4.0
Renewable			-	-	0.2	0.3
Alternative			-	-	0.2	0.1
TOTAL			6.6	6.8	6.5	6.3
Boral North America						
Natural Gas			2.9	2.9	2.8	2.3
Electricity			0.5	0.8	0.7	0.8
Diesel and liquid fuels			0.3	0.9	0.7	0.7
Coal			0.0	-	-	-
Renewable			0.2	0.1	0.1	-
Alternative			0.1	0.1	0.0	0.0
TOTAL			4.0	4.8	4.4	3.8
USG Boral – 50% interest						
Natural Gas			3.5	3.6	3.4	3.0
Electricity			0.4	0.4	0.4	0.4
Diesel and liquid fuels			0.3	0.2	0.3	0.2
Coal			-	-	-	-
Renewable			-	-	-	-
Alternative			0.0	0.0	0.1	0.2
TOTAL			4.2	4.3	4.1	3.8
Energy consumption (units of measure)						
Natural gas (PJ)						
Boral Australia			2.3	2.1	2.1	2.0
Boral North America			2.9	2.9	2.8	2.3
USG Boral – 50% interest			3.5	3.6	3.4	3.0
TOTAL			8.7	8.7	8.2	7.4
Electricity (kWh)						
Boral Australia			411	438	415	393
Boral North America			128	219	206	210
USG Boral – 50% interest			118	124	117	110
TOTAL			657	781	737	713
Diesel and liquid fuels (m litres)						
Boral Australia			86	92	92	89
Boral North America			8	26	20	21
USG Boral – 50% interest			6	6	6	6
TOTAL			100	124	119	115
Coal (k tonnes)						
Boral Australia			225	234	201	189
Boral North America			2	0	-	-
USG Boral – 50% interest			-	-	-	-
TOTAL			227	235	201	189
Renewable (PJ)						
Boral Australia			0.1	0.4	0.6	0.7
Boral North America			0.2	0.1	0.1	-
USG Boral – 50% interest			-	-	-	-
TOTAL			0.3	0.5	0.7	0.7

Emissions and energy (continued)

	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Alternative (PJ)						
Boral Australia			-	-	0.2	0.1
Boral North America			0.1	0.1	0.0	0.0
USG Boral – 50% interest			0.0	0.0	0.1	0.2
TOTAL			0.1	0.1	0.3	0.3

Energy costs

By division

Boral Australia (A\$m)			197	250	226	191
Boral North America (US\$m)			28	49	41	41
USG Boral – 50% (US\$m)			47	51	50	42
TOTAL (A\$m)			295	380	353	315
US\$/A\$ rate			0.7536	0.7735	0.7145	0.6703

Pollutant emissions (tonnes)

As part of the National Pollutant Inventory (NPI) scheme, Boral reports nitrogen oxides (NOx), sulphur oxides (SOx) and particulate matter for significant operating sites across its Australian operations. Further detailed data available at npi.gov.au.

Facilities reporting (number)	98	99	96	95	99	
NOx emissions	5,302	4,403	5,078	3,985	5,660	FY2020 data available late CY2020
SOx emissions	824	592	675	205	157	
Particulate matter (PM10) ⁷	4,352	4,942	12,564	8,621	9,093	
Dioxins/furans					-	
Volatile organic compounds (VOCs)					248	
polycyclic aromatic hydrocarbons (PAHs)					0.5	
Heavy metals					0.3	

1. Reported Scope 3 emissions for FY2018 are limited to specified activities only. FY2019 data restated where possible to improved methodology adopted in FY2020.
2. Assumes that for every one tonne of fly ash sold approximately 0.8 tonnes of CO₂-e is displaced. Refer page 41 of 2020 Boral Review & Sustainability for further details
3. FY2012 Building Products includes emissions from Boral's Australian based Gypsum operations; these are disclosed separately from FY2013.
4. Data up to FY2014 is for Boral Gypsum which was 100% owned until February 2014; thereafter emissions are for Boral's 50% interest in the USG Boral joint venture.
5. FY2017 USG Boral carbon emissions for Asia have been re-stated based on country specific emission factors.
6. Reported group revenue has been adjusted to reflect underlying revenue as follows: FY2012 includes revenue from Lafarge Boral Gypsum Asia joint venture; From March 2014, includes Boral's 50% revenue share of the USG Boral joint venture; From FY2017, includes Boral's 50% revenue share of the Meridian Brick joint venture FY2017 excludes Headwaters revenue, acquired in May 2017, as Headwaters carbon emissions are only consolidated from FY2018.
7. The substantial increase in FY2017 is due to improved data capture calculations.

Safety outcomes

	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Reportable fatalities						
Employees	nil	nil	nil	nil	nil	nil
Contractors	nil	nil	nil	nil	nil	nil
Injury rates ^{1,2}						
	Data excludes <50% owned JVs			Comparable data		
Boral Group – employees and contractors						
Lost time injury frequency rate (LTIFR)	1.8	1.3	1.5	1.6	1.3	1.6
Medical treatment injury frequency rate (MTIFR)	10.3	7.5	6.6	7.1	6.2	6.0
Recordable injury frequency rate (RIFR)	12.1	8.8	8.1	8.7	7.5	7.6
Near miss frequency rate (NMFR)						2,310
RIFR by division – employees and contractors						
Boral Australia	18.3	13.1	11.2	11.3	10.5	9.8
Boral North America	6.1	5.2	6.7	8.9	7.6	7.9
USG Boral	3.0	3.0	3.6	4.5	3.4	3.8
Boral Group – employees						
LTIFR					1.4	1.5
MTIFR					6.5	6.2
RIFR					7.9	7.7
Boral Group – contractors						
LTIFR					1.2	1.7
MTIFR					5.3	5.4
RIFR					6.5	7.3
Leading indicators						
Hazards reported						~132,000
Near-misses reported						~120,000

1 Per million hours worked for employees and contractors in 100% owned businesses including Headwaters, and all joint venture businesses regardless of equity interest from FY2018 onwards. Data for prior years only includes 50% owned joint ventures and excludes Headwaters.

2 RIFR is the combined LTIFR and MTIFR.

Our people

	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Employees – FTE						
Boral ¹	8,356	8,334	11,499	11,898	11,916	11,073
Joint venture employees ²	3,676	3,724	4,976	5,233	5,188	5,096
Boral employees, including joint ventures	12,032	12,058	16,475	17,131	17,104	16,169
By division³						
Boral Australia	6,797	6,148	6,250	6,510	6,628	6,281
Boral North America	2,357	2,457	7,053	7,096	6,937	6,384
USG Boral	2,878	3,453	3,172	3,526	3,539	3,504
By country / region (%)						
Australia / New Zealand					43	44
North America					40	39
Asia					15	15
Other					2	2
Contractors – Full time equivalent (FTE)						
Boral Australia	~4,300	~4,700	~4,700	~4,900	~5,100	~4,700
Boral North America	~100	~100	~100	~300	~200	~100
Total Boral	~4,400	~4,800	~4,800	~5,200	~5,300	~4,800
Boral Australia joint ventures			~100	~100	~100	~100
USG Boral	~3,000	~3,400	~3,300	~3,400	~4,000	~2,700
Joint venture contractors ²	~3,000	~3,400	~3,400	~3,500	~4,100	~2,800
Boral, including joint ventures			~8,200	~8,700	~9,200	~7,600
Employees^{4,5} – FTE						
By employment contract type (%)						
Full-time employees						98
Part-time employees						2
Permanent employees						97
Casual employees						3
Gender diversity (%)						
Women at Boral	14	14	18	18	19	19
- Boral Australia			13	14	13	13
- Boral North America			22	23	25	25
- USG Boral			18	18	17	17
Women on Board of Directors	38	50	50	50	43	43
Women Executive Committee members	23	27	23	23	25	27
Women in management positions	13	11	14	15	16	16
Women in professional positions			36	35	33	35
Women new hires		17	18	22	24	23
By occupation (%)						
Operators and drivers			58	57	54	53
Technicians and trade			10	10	11	11
Clerical and administrative			8	8	8	8
Sales			9	8	8	8
Other			15	17	19	20
Average length of service (years)						
Boral Group			8.4	8.1	8.0	9.1
- Boral Australia	9.2	9.1	9.3	9.0	8.9	9.4
- Boral North America	7.8	7.6	8.1	6.8	6.5	8.4
- USG Boral			9.4	9.3	9.3	9.8

Our people (continued)

	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Employees^{4,5} – FTE						
20+ years service (%)						
Boral Group				12	12	14
- Boral Australia				13	12	13
- Boral North America				9	9	14
- USG Boral				15	16	17
Average age of employees (yrs)						
Boral Group				43.4	43.4	43.8
- Boral Australia				44.9	44.8	45.3
- Boral North America				43.3	43.5	44.1
- USG Boral ⁴				40.7	40.6	41.0
Age profile (%)						
<i>Female</i>						
Employees under the age of 20			0	0	0	0
Employees between 20 and 29			2	3	3	3
Employees between 30 and 39			4	6	5	5
Employees between 40 and 49			4	5	5	5
Employees between 50 and 59			3	3	3	4
Employees over the age of 60			1	1	1	1
<i>Male</i>						
Employees under the age of 20			0	0	1	1
Employees between 20 and 29			10	11	12	12
Employees between 30 and 39			18	20	20	21
Employees between 40 and 49			24	22	22	21
Employees between 50 and 59			24	20	20	19
Employees over the age of 60			10	8	8	9
Length of service (%)						
<i>Female</i>						
Up to 5 years			9	10	11	12
Between 6 and 10 years			2	3	3	3
Between 11 and 15 years			1	2	2	2
Between 16 and 20 years			1	1	1	2
More than 21 years			1	1	1	1
<i>Male</i>						
Up to 5 years			45	42	44	44
Between 6 and 10 years			16	16	15	14
Between 11 and 15 years			9	9	8	9
Between 16 and 20 years			5	5	5	5
More than 21 years			11	10	10	9
Turnover (%)						
<i>Boral Group</i>						
Voluntary			18	15	20	23
Involuntary			10	10	14	17
<i>Boral Australia</i>	18		18	15	17	18
Voluntary			10	11	13	12
Involuntary			8	4	4	6
<i>Boral North America</i>	15		17	16	29	36
Voluntary			8	8	18	25
Involuntary			9	8	11	12
<i>USG Boral</i>						
Voluntary				12	8	9
Involuntary				8	6	6
				4	2	3
						2

Our people (continued)

	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Pay equity outcome - Boral Australia						
<i>Boral Australia</i>						
Female-to-male average base salary ratio ⁶		1.01:1.00	1.02:1.00	1.01:1.00	1:1	1:1
Training and development (#)						
<i>Boral Australia</i>						
Employees completed leadership training ⁷					709	909
Employees completed job specific training ⁸					1,330	1,093
Employee engagement survey results (%)						
Boral Australia - McKinsey Organisational Health Index	70	-	-	72	-	
USG Boral - AON Hewitt Employee Engagement Survey	50	-	56	-	65	
Workplace relations (#)						
Enterprise or industrial agreements				79	82	92
Employees covered by enterprise or industrial agreement				~3,700	~3,400	~3,800

1. FY2017 includes 4,016 FTE employees from Headwaters and excludes employees from Boral Bricks In North America, who were included as joint venture employees.
2. Includes USG Boral, Meridian Brick and other small Australia-based joint ventures.
3. Includes corporate and joint venture employees.
4. Excludes joint ventures.
5. Includes Meridian Brick joint venture.
6. Calculated as the average base cash salary for females as a proportion of the average base cash salary for males, as included in our confidential report the Workplace Gender Equality Agency.
7. Includes General Manager and Emerging Leader programs, and zero|one|ten Leader program.
8. Includes Certificates II, III or IV, diploma qualifications, units of competency, and tailored learnings solutions and training modules.