



# Addressing greenhouse gas emissions beyond our operations: Understanding the 'scope 3' footprint of our value chain

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# Addressing greenhouse gas emissions beyond our operations: Understanding the 'scope 3' footprint of our value chain

Climate change is a global challenge that requires a collaborative market and policy response, and expectations of the role that industry should play in contributing to international climate commitments and delivering the transition to a lower carbon economy are increasing.

Last year, BHP set the long-term goal of achieving net-zero operational (scope 1 and 2) greenhouse gas (GHG) emissions in the second half of this century, consistent with the Paris Agreement. However, while reducing our operational emissions is vital, emissions from our value chain (scope 3) are many times greater than those from our own operations.

The most significant contribution to scope 3 emissions in our value chain comes from our customers' processing and use of the products we sell. In particular, emissions emanating from the processing and use of our iron ore and metallurgical coal in steelmaking make up well over half of the total.

Understandably then, there is growing interest from our investors and other stakeholders not only in how these emissions should be addressed, but also in the broader value to society and contribution to economic development of the commodities we produce, and how our business will be impacted by the low carbon transition.

Our approach to addressing scope 3 emissions is evolving. In this paper, we set out the challenges and opportunities inherent in measuring and addressing GHG emissions beyond the boundaries of our operations, describe our value chain's scope 3 'footprint' in more detail, and explain how we are developing an improved approach to calculating, communicating and tracking scope 3 emissions that will better serve our decision-making needs and those of our stakeholders.

Understanding and addressing scope 3 emissions in our value chain remains a priority for BHP. We recognise that we have a stewardship role in working with others in our value chain to achieve emissions reductions across the full lifecycle of our products. We will look to work with our customers, investors, and resource sector peers to develop an appropriate response to meeting this challenge, and capitalise on the long term opportunities for our business in doing so.

Sustainable development requires an effective global response to the clear, and growing, risks that climate change poses to economies, societies and the environment. Playing our part in responding to climate change is a priority governance and strategic issue for BHP. We are committed to reducing our operational greenhouse gas (GHG) emissions, building our resilience to the impacts of climate change and working in partnership with others to enhance the global policy and market response.

Last year, we set the long-term goal of achieving net-zero operational (scope 1 and 2) GHG emissions in the second half of this century, consistent with the Paris Agreement. However, while reducing our operational emissions is vital, emissions from our value chain (scope 3 emissions) are significantly higher than those from our own operations. In order to understand and manage our exposure to climate-related risk, and to capitalise on the opportunities arising from the transition to a lower carbon economy, we need to properly account for these emissions.

Expectations of the role that industry should play in contributing to international climate commitments and delivering the transition to a lower carbon economy are increasing. Understandably then, there is growing interest from our investors and other stakeholders in how scope 3 emissions in our value chain should be addressed and the associated risks and opportunities.

The recommendations of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD) address the risks and opportunities arising from both the low carbon transition and the physical impacts of climate change.<sup>1</sup> In its recommendations, the TCFD states that organisations should assess not only the potential direct effects of climate change on their operations, but also the *"potential second and third order effects on their supply and distribution chains"*, and explicitly recommends that organisations disclose scope 3 emissions associated with their business and the related risks. The TCFD also notes that *"transition risk scenarios are particularly relevant for resource-intensive organisations with high GHG emissions within their value chains, where policy actions, technology, or market changes aimed at emissions reductions, energy efficiency, subsidies or taxes, or other constraints or incentives may have a particularly direct effect"*.

Some investors have also started to turn their attention from consideration of companies' resilience to climate-related risk to focus on the actions companies in high emitting sectors, such as energy and mining, are taking to align their emissions performance with the goals of the Paris Agreement. For example, the investor-led Climate Action 100+ initiative asks companies to *"take action to reduce GHG emissions across the value chain, consistent with the Paris Agreement's goal of limiting global average temperature increase to well below 2°C above pre-industrial levels"*.<sup>2</sup> The asset owner-led Transition Pathway Initiative is developing sector-specific methodologies to assess and benchmark how companies' *"carbon performance [including scope 3 emissions] now and in the future might compare to the international targets and national pledges made as part of the Paris Agreement."*<sup>3</sup>

There is also an increasing desire from downstream end users of our products (our customers' customers) to see upstream emissions reduced, and more broadly to ensure that the raw materials they procure are sustainably and responsibly produced. This trend is particularly notable for companies in the electronics, automotive and other consumer-facing sectors. As climate policies and emissions standards in our key markets become more stringent over the coming years, we would expect to see increasing interest from our customers in reducing their operational emissions (scope 3 emissions for our business) and in partnering with us to do so.

1 The TCFD was established in 2015 to consider how voluntary corporate disclosures could more effectively meet investors' demands for decision-useful, forward-looking information on the potential impacts of climate change on companies' business models. Its recommendations – released in June 2017 – covered the overarching themes of governance, strategy, risk management, and metrics and targets. BHP was one of the first companies in the world to align its disclosures (in our 2017 Annual Report) with the recommendations of the TCFD.

2 <http://www.climateaction100.org/>

3 <http://www.lse.ac.uk/GranthamInstitute/tpi/>

## The scope 3 footprint of our value chain

'Scope 3' is the term used to describe the indirect GHG emissions resulting from activities in our value chain but outside of our operational control. They include upstream emissions related to the extraction and production of the materials we purchase for use at our operations; downstream emissions from our customers' processing and use of the products we sell; emissions from both upstream and downstream transportation activities; and scope 1 and 2 emissions from our non-operated assets.<sup>4</sup>

In FY2017, we estimated scope 3 emissions in our value chain to be 585 million tonnes of carbon dioxide equivalent (CO<sub>2</sub>-e)<sup>6</sup>, compared to our operational emissions (scopes 1 and 2 combined) of 16 million tonnes CO<sub>2</sub>-e.<sup>7</sup>

The most significant contributors to scope 3 emissions associated with our business are those resulting from our customers' processing and use of our products, which in FY2017 accounted for around 97% of the total. In particular, emissions emanating from the steelmaking process (the processing and use of our iron ore and metallurgical coal) made up over 65% of the total scope 3 emissions for our business. Emissions from the combustion of our energy commodities (energy coal, natural gas and petroleum products) were estimated at around 25% of the total in FY2017.

### GHG Protocol emissions scopes and categories

The *GHG Protocol Corporate Accounting and Reporting Standard*, published by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), is widely used by governments, businesses and other organisations to define and categorise GHG emissions for reporting purposes. This standard classifies corporate GHG emissions into three 'scopes'.

- **Scope 1** emissions are direct GHG emissions from operations that are owned or controlled by the reporting company (e.g., for BHP, emissions from fuel consumed by haul trucks at our mine sites);
- **Scope 2** emissions are indirect emissions from the generation of purchased energy consumed by a company (e.g. emissions from electricity BHP buys from the grid for use at our mine sites);
- **Scope 3** emissions are all other indirect emissions (not included in scope 2) that occur in the value chain of the reporting company (e.g., for BHP, emissions from our customers' use of the coal we sell in their power stations).

The *GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard* further divides scope 3 emissions into upstream and downstream emissions, based on the financial transactions of the reporting company.

- **Upstream** emissions are indirect GHG emissions related to purchased or acquired goods and services;
- **Downstream** emissions are indirect GHG emissions related to sold goods and services.

Scope 3 emissions are then categorised into fifteen distinct categories, designed in principle to be mutually exclusive such that for a given company there is no double counting of emissions between categories.

Source: *GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard*.<sup>5</sup>

<sup>4</sup> Assets that are owned as a joint venture but not operated by BHP.

<sup>5</sup> <https://ghgprotocol.org/standards/scope-3-standard>

<sup>6</sup> Note that there is an element of double counting across emissions categories for our iron ore and metallurgical coal products; both are used in the same process (steelmaking) further downstream, which inflates the total scope 3 emissions figure.

<sup>7</sup> For our full FY2017 emissions performance data, including details of our scope 1 and 2 emissions, please refer to our 2017 Sustainability Report, available to download at <https://www.bhp.com/-/media/documents/investors/annual-reports/2017/bhpsustainabilityreport2017.pdf>

## Scope 3 emissions inventory<sup>1</sup>

Scope 3 category		FY2017 emissions (million tonnes CO <sub>2</sub> -e)
<b>Upstream</b>	Purchased goods and services (including capital goods)	7.7
	Fuel and energy related activities	1.4
	Upstream transportation and distribution <sup>2</sup>	3.2
	Business travel	0.1
	Employee commuting	<0.1
	<b>Downstream</b>	Downstream transportation and distribution <sup>3</sup>
	Processing of sold products <sup>4</sup>	313.7
	Iron ore to steel	309.5
	Copper cathode to copper wire	4.2
	Use of sold products	254.0
	Metallurgical coal	105.5
	Energy coal	72.1
	Natural gas	38.3
	Crude oil and condensates <sup>5</sup>	33.1
	Natural gas liquids (NGLs)	5.1
	Investments (i.e. our non-operated joint assets) <sup>6</sup>	1.9
<b>Scope 3 total<sup>7</sup></b>		<b>584.9</b>

1 Scope 3 emissions have been calculated using methodologies consistent with the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (Scope 3 Standard). For further detail on the basis of preparation of the FY2017 scope 3 inventory for our business please refer to <https://www.bhp.com/-/media/documents/investors/annual-reports/2017/bhpscope3emissionsbasisofcalculation2017.pdf>

2 Because the Scope 3 Standard categorises scope 3 emissions as upstream or downstream on the basis of financial transactions, this includes product transport where freight costs are covered by BHP (e.g. under CFR or similar terms), as well as purchased transport services for process inputs to our operations.

3 Product transport where freight costs are not covered by BHP (e.g. under FOB or similar terms).

4 All iron ore production is assumed to be processed into steel and all copper metal production is assumed to be processed into copper wire for end-use. Processing of nickel, zinc, gold, silver, ethane and uranium oxide is not currently included, as production volumes are much lower than iron ore and copper and a large range of possible end uses apply. Processing/refining of petroleum products is also excluded as these emissions are considered immaterial compared to the end-use product combustion reported in the 'Use of sold products' category.

5 All crude oil and condensates are conservatively assumed to be refined and combusted as diesel.

6 For BHP, this category covers the scope 1 and 2 emissions (on an equity basis) from our assets that are owned as a joint venture but not operated by BHP. The Scope 3 Standard categorises this as a downstream category as the provision of capital or financing is framed as a service provided by BHP.

7 There is an element of double counting across emissions categories for our iron ore and metallurgical coal products; both are used in the same process (steelmaking) further downstream, which inflates the total scope 3 emissions figure.

# How we calculate our scope 3 emissions

In order to contribute to addressing scope 3 emissions in our value chain and manage the associated risks and opportunities, we first need to understand them. We have been publicly reporting our operational (scope 1 and 2) emissions – and undertaking initiatives to reduce them – since the 1990s. Scope 3 emissions accounting is a less mature field, and our approach to reporting these emissions is correspondingly less well established. We prepared and disclosed the first full scope 3 inventory covering all material categories of emissions associated with our business – as shown in the table above – in FY2016. Prior to FY2016, we reported only emissions in the ‘Fuel and energy related activities’ and ‘Use of sold products’ categories.

## Our current approach

We calculate scope 3 emissions using methodologies consistent with the *GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard* (Scope 3 Standard). Building on the earlier *GHG Protocol Corporate Accounting and Reporting Standard*, the Scope 3 Standard was developed with the aim of providing a standardised approach and set of principles for companies to use in preparing scope 3 inventories. It is the accounting standard used by the majority of those companies that report scope 3 emissions.

The Scope 3 Standard identifies five generally accepted principles as underpinning and guiding the effective preparation and disclosure of a corporate scope 3 inventory: relevance, completeness, consistency, transparency, and accuracy. As with financial accounting and reporting, application of these principles is intended to ensure that the resulting scope 3 inventory represents a faithful, true, and fair account of the emissions from a company’s value chain.

### Scope 3 Standard accounting and reporting principles

- **Relevance:** Ensure the GHG inventory appropriately reflects the GHG emissions associated with the company and serves the decision-making needs of users – both internal and external to the company.
- **Completeness:** Account for and report on all GHG emission sources and activities within the inventory boundary. Disclose and justify any specific exclusions.
- **Consistency:** Use consistent methodologies to allow for meaningful performance tracking of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.
- **Transparency:** Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.
- **Accuracy:** Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable confidence as to the integrity of the reported information.

Source: *GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard*.



In practice, completing a scope 3 inventory may sometimes require trade-offs between principles. Our current calculation approach (as applied from FY2016 onwards) focuses primarily on achieving completeness – ensuring we account for all material emissions sources within our inventory boundary. This has required the use of less accurate data for some emissions categories. For example, where primary data is unavailable, we use publicly available ‘industry average’ emissions factors, or ‘proxy’ input data or assumptions.

Further detail on the methodology we use to calculate scope 3 emissions in our value chain is disclosed in the *Scope 3 emissions basis of calculation* document that accompanies our annual Sustainability Report.<sup>8</sup> Our current calculation approach has supported our original goal of developing an understanding of the relative magnitude of emissions-generating activities both within and across the various scope 3 emissions categories. It has allowed us to identify the emissions ‘hot spots’, which are where both our greatest exposure to risk and the most material emissions reduction opportunities are likely to lie, and to prioritise future effort accordingly.

### **Limitations of our current approach**

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However, we recognise that our current approach has a number of limitations.

The use of industry-average emissions factors to estimate emissions from the most material emissions categories for our business – the processing and use of our products – means that this data will not necessarily be representative of the specific activities taking place within our value chain, or reflect the effect of the quality of our products on the emissions associated with their use. There is consequently a degree of uncertainty in the emissions we report.

Generally speaking, the reported emissions for the processing of our non-energy commodities are subject to a higher degree of uncertainty than those from the combustion of our energy products, because emissions from the industrial processes involved are more dependent on process route, raw material quality and eventual end use – and therefore more variable by individual facility. This is one reason why preparing an accurate scope 3 inventory is more challenging for a diversified miner than is the case for an oil and gas producer or coal mining company.

For example, within the ‘Processing of sold products’ emissions category, we calculate the emissions from the processing of our iron ore to steel by our customers based on our total iron ore production volume for the year and an industry-wide emissions factor sourced from the World Steel Association’s annual *Sustainability Indicators* report.<sup>9</sup> This emissions factor is based on data reported on a voluntary basis by steelmakers. The crude steel produced by these reporting companies represents just over half of global production, allowing an industry-average emissions factor to be calculated based on route-specific CO<sub>2</sub> intensities for the major steelmaking technologies (the basic oxygen furnace (BOF) and electric arc furnace (EAF)), weighted based on the production share of each technology.

As a result, the emissions factor may not accurately represent (geographically, technologically or temporally) the actual emissions intensities of our customers’ facilities. It is considered, however, to be sufficiently representative of average industry conditions as to provide a meaningful first estimate. This top down approach to calculating the emissions from the processing and use of our products is consistent with that disclosed by our peers in the resources sector.

Some of our products have a number of potential downstream applications, each of which will have a different emissions profile, and the eventual end uses of our products may be unknown. In these cases, we must make various assumptions about the most likely processing route or end-use, and in doing so, unavoidably introduce an additional source of uncertainty into our reported emissions. For example, in the case of our petroleum products, all crude oil and condensates are assumed to be refined and combusted as diesel (rather than alternative products such as gasoline) as the most emissions-intensive assumption. Similarly, in estimating the emissions from processing our copper products, we apply an emissions factor for the processing of copper cathode to copper wire (rather than alternative products such as tubes or sheets), as this is the most emissions-intensive process and therefore the most conservative assumption.

<sup>8</sup> <https://www.bhp.com/-/media/documents/investors/annual-reports/2017/bhpscope3emissionsbasisofcalculation2017.pdf>

<sup>9</sup> <https://www.worldsteel.org/steel-by-topic/sustainability/sustainability-indicators.html>

An additional level of uncertainty is introduced into the overall scope 3 inventory for our business because (in common with other producers of raw materials) there is a degree of overlap in reporting boundaries due to our involvement at multiple points in the lifecycle of the commodities we produce and consume. The most significant example of this relates to the emissions from the processing of our iron ore to steel, reported under the 'Processing of sold products' emissions category. Steel production also consumes metallurgical coal as an input, a portion of which is produced by us. For reporting purposes, we account separately for scope 3 emissions from the use of our metallurgical coal with all other fossil fuels under the 'Use of sold products' category. This means that a portion of metallurgical coal emissions are accounted for under two categories. This double counting necessarily inflates the total scope 3 emissions we report.

While in principle the emissions categories defined by the Scope 3 Standard are designed to be mutually exclusive, this double counting of emissions in the current scope 3 inventory for our business is an expected outcome of emissions reporting between the different scopes and categories as applied in practice to a producer of raw materials. While not detracting from the overall value of our scope 3 emissions disclosure, it does mean that care should be taken when using the reported figure for total scope 3 emissions in our value chain (for example to benchmark our emissions performance against others within the sector) – and it may be more useful to consider each emissions source separately.

Our 'conservative' approach to each of the double counting of emissions; selection of emissions factors; and assumptions about product processing routes and end uses results in over-reporting, rather than under-reporting, of emissions.

An additional limitation resulting from our use of secondary data and industry-average emissions factors is that (for the emissions categories in question) we are unable to effectively track performance over time in relation to those scope 3 emissions. For example, for emissions from the processing of our iron ore to steel, the emissions intensity that we report will simply track changes in the industry-average emissions intensity; and our absolute emissions reporting will change based only on variations in iron ore production volumes, rather than any actual emissions performance improvements at facilities that use our products.

### Double counting in scope 3 accounting

By definition, scope 3 emissions occur from sources owned or controlled by other entities in the value chain, and in certain cases, two or more companies may account for the same emissions within the scope 3 inventories they calculate. This type of double counting is an inherent characteristic of scope 3 accounting, and it is why scope 3 emissions should not be aggregated across companies to determine total emissions in a given sector or region.

Double counting between companies is considered acceptable because it is recognised that each entity in the value chain has differing degrees of influence and different opportunities to reduce emissions, so allowing this form of double counting within scope 3 accounting facilitates the simultaneous action of multiple entities to contribute to the reduction of emissions.

Within a single corporate inventory, however, double counting should ideally be avoided or minimised where possible.

Where they are not based on data related to specific activities or facilities within our value chain, the emissions that we report are unable to reflect actions to reduce emissions undertaken by our suppliers, customers or other value chain participants – either independently or in partnership with us. The ability to track emissions performance and capture the effects of emissions reduction activities is a prerequisite for setting future targets for these emission sources.

## Our approach to addressing scope 3 emissions is evolving

Our approach to addressing scope 3 emissions is evolving: we are improving our scope 3 accounting process; developing appropriate metrics and targets that will enable us to track emissions performance and manage our exposure to risk; and looking for opportunities to scale up our current activities to influence emissions reductions across our value chain.

### Improving our scope 3 accounting process

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We are currently developing an enhanced approach to calculating, communicating and tracking scope 3 emissions in our value chain that addresses the limitations described above, and better serves our decision-making needs and those of our stakeholders. This is intended to be an ongoing and iterative process that will be guided by consideration of how we can better implement each of the Scope 3 Standard guiding principles of relevance, completeness, consistency, transparency, and accuracy.

During FY2018, our focus has been on improving the *transparency and relevance* of our disclosure approach while maintaining consistency in our calculation methodology. For our FY2018 data (soon to be published as part of our 2018 Annual Reporting suite), we will continue to report against the scope 3 categories defined by the Scope 3 Standard, but where it enhances relevance and transparency – or where particular emission sources are deemed critical by key stakeholders or contribute to our risk exposure – we will further disaggregate this data by commodity, business unit or activity, as appropriate. We will also provide additional context where necessary to allow users of scope 3 emissions data for our business to understand the underlying drivers for any changes in the emissions performance we report over time.

We will also provide more detailed and accessible information about the methodologies we use to calculate scope 3 emissions, and the assumptions and data sources relied upon. We will undertake and disclose the results of a data quality and uncertainty assessment to better identify and quantify the sources of uncertainty in the scope 3 inventory for our business, including the magnitude of the uncertainty introduced by the double counting of a proportion of the emissions from the processing and use of our iron ore and metallurgical coal, which is likely to be significant. This additional clarity and transparency will allow external stakeholders to better understand the inherent limitations of our current scope 3 calculation approach and for what purposes the resulting emissions data should and should not be relied upon.

Looking forward, our focus is on improving the *accuracy and relevance* of our approach, particularly the methodologies we use for calculating emissions from the processing and use of our products. The goals of this work are threefold: (1) to increase the quality of the data and reduce the level of uncertainty in the emissions we report to enable decisions to be made by BHP and our stakeholders with reasonable confidence as to the integrity of the reported information; (2) to allow tracking of performance over time such that the effects of emissions reduction activities are captured; and (3) to allow us to identify and prioritise emissions reduction opportunities within our value chain.

## Developing metrics and targets

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The TCFD recommends that companies disclose details of the metrics and targets used to assess and manage their material climate-related risks and opportunities, and we have recently seen examples of oil and gas producers setting ambitions to reduce the emissions associated with their products.

For companies operating in the energy sector, it is possible to use various energy intensity metrics as the basis for articulating such ambitions. For a diversified mining company such as BHP that produces a range of both energy and non-energy commodities, defining a set of metrics with which to measure the overall 'climate performance' of our business is more challenging. It needs to capture the complexity arising from the diversity of our portfolio, the variety in lifecycle emissions for different products, the impacts of product quality, and the variations in risk profile and mitigation opportunities associated with different scope 3 emissions sources.

Potential emissions reduction strategies need to be customised to the commodity. For example, reducing the scope 3 emissions from our energy commodities (energy coal, natural gas and petroleum products) could be achieved by diversifying towards lower carbon energy sources (including shifting from oil to gas), whereas reducing the emissions intensity related to the processing of non-energy commodities (such as iron ore) relies on the decarbonisation of the relevant industrial process (such as steelmaking) employed by our customers.

In addition, while fossil fuels are 'single use' products, the emissions intensity of the initial steel or copper production process must be weighed against the value provided by the final product over the course of its long (potentially endless) lifecycle – including multiple secondary uses following recycling. This will be of increasing significance as we move towards a more circular economy.

Developing a more accurate scope 3 inventory will help us define additional metrics that allow us to assess emissions performance within and across scope 3 emissions categories, and capture the risks and opportunities that the low carbon transition presents to our business. This in turn will provide us with a better understanding of what an appropriate long-term strategy and level of ambition for our contribution to addressing scope 3 emissions might look like.

## Enabling comparability

We also recognise that some stakeholders are interested not only in our own performance and the actions that we are taking, but also in how we are positioned relative to our peers and how well our performance is aligned to global benchmarks (such as sectoral 2°C emissions scenarios).

The Scope 3 Standard is designed to support consistent and transparent public reporting of corporate scope 3 emissions according to a standardized set of reporting requirements, to enable comparisons of the scope 3 emissions associated with a company over time. It is not, however, intended to support comparisons between companies, and significant differences in scope 3 emissions reported by companies – even within the same sector – may result due to differences in the specific calculation methodologies used. For the diversified mining sector, the relatively high degree of uncertainty in companies' emissions reporting for product processing and use, as well as differing mixes of commodities in companies' portfolios, currently hinders reliable cross-company comparisons or benchmarking.

We are committed to working with the relevant external stakeholders to develop appropriate sector-specific methodologies, guidance, and corporate reporting standards that would provide the additional consistency and more useful disclosures required to support such assessments.

## Influencing emissions reductions

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By definition, scope 3 emissions occur from sources that are not owned or controlled by BHP, but by our customers, suppliers and others in our value chain. We believe we have a shared role in addressing these emissions.

For some emissions sources, we have the ability to influence our suppliers or other service providers to reduce emissions from their activities. The benefit of obtaining accurate and relevant scope 3 data, developing appropriate metrics with which to track performance, and using our influence to reduce emissions is demonstrated by recent activities to reduce emissions from freight. We worked with an external partner to develop data analytics to measure the GHG emissions of the marine fleet we charter, benchmarked the emissions performance of individual vessels, and implemented vetting criteria to exclude vessels with poor emissions performance.

## Reducing our freight emissions

BHP is one of the largest global shippers of bulk commodities, and emissions resulting from the transportation and distribution of our products are a sizeable source of scope 3 emissions. We are working on initiatives to reduce our freight emissions and seek to drive change more broadly within the shipping industry.

Over the last few years, we have collaborated with RightShip, a leading maritime risk management and environmental assessment organisation<sup>10</sup>, to develop a calculation methodology for measuring a vessel's GHG emissions. Using this 'Existing Vessel Design Index' (EVDI), we can now measure, benchmark and track emissions performance across the freight associated with our business. Based on the EVDI, a practical GHG Emissions Rating on an A to G scale has also been developed for use across the industry. This allows transparent comparison of a ship's emissions performance relative to vessels of a similar size and type.

As part of our commitment to sustainable shipping, in 2017 we decided to no longer accept (almost without exception) vessels with the lowest F and G ratings. We are already starting to see the impact on the scope 3 emissions profile for transportation and distribution, including a number of examples where application of our vetting criteria has resulted in significant reductions in GHG emissions for individual voyages.

We have also started to see a response from the shipping industry. Examples of actions taken by our strategic partners (ship owners) include engagement with engine manufacturers to carry out engineering modifications; and a variety of technical adjustments to reduce emissions including limiting engine power output, installing propulsion improvement devices, and applying advanced silicon paints.

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<sup>10</sup> RightShip is equally owned by BHP, Rio Tinto and Cargill. <https://site.rightship.com/>

For other emissions sources, such as the downstream processing of our products, the fact that these emissions occur 'outside the gate' makes them more challenging to address. However, we recognise that, even though we can't typically directly influence scope 3 emissions, we have a stewardship role in working with others in our value chain to achieve emissions reductions across the full lifecycle of our products. We already work directly with our customers to help them improve the productivity and environmental performance of their processes based on the quality characteristics of our products.

In the case of emissions from steelmaking, for example, we produce premium low volatile (PLV) coking coals that can be processed into high strength metallurgical coke, allowing our customers to increase productivity and lower external energy requirements in the blast furnace.<sup>11</sup>

There is opportunity to build on these relationships to identify strategic opportunities to partner in implementing projects with the potential to achieve more material emissions reductions.

We also work in partnership with others to accelerate the development of low emissions technologies such as Carbon Capture and Storage (CCS) with the potential to deliver step-change emissions reductions from the processing and use of our products over a longer time horizon. Our various CCS investments and partnerships focus on mechanisms to reduce the costs and accelerate deployment of this critical technology, and include activities aimed at knowledge sharing from commercial-scale projects, development of sectoral deployment roadmaps, and funding for research and development at leading universities and research institutes.

As we continue to develop a better understanding of our value chain's scope 3 footprint, we will be able to more readily identify and prioritise opportunities to influence emissions reductions, focus our efforts where they are likely to have the greatest impact, and scale up our current activities.

### Accelerating the development of CCS

Emissions from the industrial sector represent around a quarter of global emissions, and more than half of these originate from the chemical and thermal processes currently used to produce steel and cement – essential products needed by developing economies to build their cities and infrastructure.

CCS has the potential to play a pivotal role in reducing emissions from industrial processes such as steel production that are recognised as being technologically difficult to decarbonise. Although CCS and its component processes have been demonstrated successfully, progress is required in developing policy frameworks to support wider deployment and, in the nearer term, industry and government must work together to develop pilot projects, demonstration plants and 'first of a kind' commercial scale operations.

As a major supplier of iron ore and metallurgical coal, BHP is committed to working with our customers, policymakers and research institutions to accelerate the deployment of this critical technology. For example, we are working with Peking University in a collaborative research project to identify the key policy, technical and economic barriers to CCS deployment in the industrial sector, with a particular focus on the iron and steel industry in China.

Other examples of our CCS partnerships include the International CCS Knowledge Centre in Saskatchewan, Canada, which we established to share lessons from SaskPower's Boundary Dam CCS project, and our support of the GeoCQuest research collaboration between the University of Melbourne, University of Cambridge and Stanford University that aims to advance fundamental research into the long-term storage mechanisms of CO<sub>2</sub> in sub-surface locations.

11 <https://www.bhp.com/media-and-insights/prospects/2018/05/iron-ore-met-coal-and-chinas-steel-reforms>

## Understanding the bigger picture

The most significant contributors to scope 3 emissions for our business are those resulting from our customers' processing and use of our products. Understandably then, our investors and other stakeholders are increasingly interested not only in how these emissions should be addressed, but also in the broader value to society of the commodities we produce, and how our business will be impacted by a transition to a lower carbon economy.

Emissions from our value chain represent the largest source of GHG emissions associated with our business, and so present significant opportunities for achieving emissions reductions. But additional opportunities lie beyond the scope 3 boundaries of our business. Scope 3 accounting does not attempt to quantify the value of our products in enabling the low carbon transition, and the associated emissions avoided through the use of our products over their lifecycle. For example, our copper products are ideally placed to support the electrification of energy demand – particularly of transport – with a battery-powered electric car requiring three times as much copper as a conventional car.

Consider also the broader social value of the commodities we produce and their contribution to economic development. Although they are emissions-intensive to produce, steel products (not to mention products manufactured using steel equipment) are ubiquitous in society and integral to transport, housing, agriculture, manufacturing, energy production, and water supply systems. Developing societies need steel to meet their infrastructure and construction needs, and steel is critical to the sectors and technologies on which a lower carbon economy will be based, such as energy and resource efficient buildings, renewable energy infrastructure, and low emissions transport.

Understanding and addressing scope 3 emissions in our value chain remains a priority for BHP. Despite the challenges inherent in measuring and addressing GHG emissions beyond the boundaries of our operations, we will look to work with our customers, investors, and resource sector peers to develop an appropriate response to meeting these challenges, and capitalise on the long term opportunities for our business in doing so.

**BHP**