BHP Billiton Scope 3 emissions

The scope 3 emissions associated with BHP Billiton's operations and activities have been calculated using methodologies consistent with the WRI Greenhouse Gas Protocol *Corporate Value Chain (Scope 3) Accounting and Reporting* Standard, further details of which are outlined in the table below. The most significant contributors are in the downstream processing and use of our sold products (Categories 10 and 11), accounting for approximately 95% of our total scope 3 emissions.

It should be noted that scope 3 emissions reporting necessarily requires a degree of overlap in emissions reporting boundaries due to our involvement at multiple points in the life cycle of the commodities we produce and consume. Three significant examples of this are:

- Scope 3 emissions reported under the 'Use of sold products' category include combustion emissions from all our produced volumes of crude oil, natural gas and coal. A portion of these are consumed further down the supply chain within in our own operations, and are therefore also reported within our scope 1 and 2 inventory.
- Scope 3 emissions reported under the 'Fuel and energy related activities' category include upstream mining and processing of consumed fuels. A portion of these fuels are produced by BHP Billiton further up the supply chain, meaning that the emissions are also included in our scope 1 and 2 emissions.
- Scope 3 emissions reported under the 'Processing of sold products' category include the processing of our produced iron ore volumes to steel. This third party activity also consumes coking coal as an input, a portion of which is produced by BHP Billiton further up the supply chain. For reporting purposes, BHP Billiton accounts for scope 3 emissions from combustion of produced coking coal with all other fossil fuels under the 'Use of sold products' category, such that a portion of coking coal emissions is accounted for under two categories.

This is an expected outcome of emissions reporting between the different scopes defined under standard greenhouse accounting practices and are not considered to detract from the overall value of our scope 3 emissions disclosure. We have attempted to capture all material scope 3 emissions and all exclusions are expected to be immaterial compared to our overall Scope 3 emissions. Unless otherwise stated below, calculations have been based upon operated assets on a 100% basis.

Category	Inclusions	Exclusions	Rationale	Data used	Calculation Methodology
1. Purchased goods and services	Upstream production and transport of purchased goods and services for the reporting year	Spend associated with activities reported under other scope 3 categories. These cover fuel consumption, upstream transport, business travel and employee commuting activities.	This is an immaterial source of scope 3 emissions for the business, however a high level estimate has been calculated for completeness and transparency.	Annual spend data is extracted from the internal system which tracks all external spend. Emission factors are sourced from the Qantis Scope 3 Evaluator tool, as recommended by the GHG Protocol.	The 'Spend-based' method from the GHG Protocol Scope 3 Guidance is used. Spend data is broken down by BHP Billiton's internal taxonomy codes and allocated to the most appropriate product group category available within the GHG Protocol Scope 3 Evaluator tool (Qantis). The emissions factors from this tool are then used to generate an overall emissions figure for this category.
2. Capital goods	As described in the GHG Protocol calculation guidance, this category can be difficult to segregate from Category 1 (Purchased goods and services). Given all of our spend data (which would include purchases of capital goods) has been captured in category 1, the scope 3 emissions from capital goods are not reported out separately. The scope 3 emissions reported under category 1 includes purchased goods and services and purchases of capital goods.				
3. Fuel and energy related activities	Upstream production and distribution of fuels and electricity consumed on the facilities over which the company holds operational control.	A small quantity of fuel reported internally under a mixed category (representing less than 2% of total energy). This quantity has been excluded due to the difficulty in assigning a meaningful scope 3 emissions factor to the variety of fuels involved.	Consumption of fuels and energy represent a material contribution to our scope 1 and 2 operating emissions; the associated scope 3 emissions are therefore also of interest.	Fuel and energy consumption data is sourced from BHP Billiton's internal database. Consumption of each type of fuel in GJ is recorded by each operation. Factors are sourced from the Australian National Greenhouse Accounts for both Australian and non-Australian operations.	The GHG Protocol's 'average-data' method is used. Scope 3 emission factors for each fuel type consumed are applied to the total consumption volumes.

Category	Inclusions	Exclusions	Rationale	Data used	Calculation Methodology
4. Upstream transportation and distribution	Purchased third party transportation services. Includes product transport where marine, road and rail freight costs are covered by the business (e.g. under CFR or similar terms). Also includes purchased transport services for process inputs to operations.	The transport of process inputs to BHP Billiton's operations where spend data is not available (i.e. transport costs are incorporated into the supplier price). These scope 3 emissions are likely to be captured under category 1 – purchased goods and services.	Emissions associated with the freight of our products to customers are of increasing interest as a component of BHP Billiton's supply chain.	Data is sourced from BHP Billiton's Freight team, including (for each product cargo) loading and destination ports, tonnage of the cargo, and the size of the vessel if freight was by sea (deadweight in kg). For emissions from transport of inputs to our operations, data is sourced from the internal system that tracks all external spend. For freight calculations, scope 3 emission factors are sourced from vessel-specific 2016 UK Defra emission factors (in tonne.km units). For other purchased transport services, factors are sourced from the Qantis Scope 3 Evaluator tool, as recommended by the GHG Protocol.	Product freight emissions are calculated using the GHG Protocol's 'distance-based' method. Loading and destination port locations are used to estimate the voyage distance (km) which is applied to each cargo (tonnes). Vessel size (deadweight) is used to assign the vessel category (bulk carrier, general cargo) and size for emission factor application. Spend data is allocated to the most appropriate category available within the GHG Protocol Scope 3 Evaluator tool (Qantis).
5. Waste generated in operations	This category has been identified as immaterial to BHP Billiton's inventory and an emissions figure is not calculated. BHP Billiton operations do not generate waste resulting in GHG emissions other than minimal quantities of domestic waste. This assessment will be periodically reviewed.				
6. Business travel	Emissions from domestic and international flights, hotel accommodation and car rental for business travel purposes.	Business travel activities for which distance or spend data is not available.	This is an immaterial source of scope 3 emissions for the business, however a high level estimate has been calculated for completeness and transparency.	Flight mileage data is sourced from BHP Billiton's corporate travel services provider. Hotel and car rental spend data is sourced from the internal system that tracks all external spend. Scope 3 emission factors for flights are referenced from the latest US EPA Centre for Corporate Climate Leadership GHG Emission Factors Hub.	For flights, the 'distance-based' method from the GHG Protocol Scope 3 Guidance is used, with industry-average emission factors applied based on whether the flight distance is categorised as a short, medium or long-haul flight. For hotel accommodation and car rental emissions, the 'spend-based' method is used as described under the 'Purchased goods and services' category's calculation methodology.

Category	Inclusions	Exclusions	Rationale	Data used	Calculation Methodology
				Factors for hotel and car rental are sourced from the Qantis Scope 3 Evaluator tool, as recommended by the GHG Protocol.	
7. Employee commuting in operations	Emissions from FIFO flights and bus services utilised by employees for commuting purposes.	Employee commuting activities for which spend data is unavailable.	This is an immaterial source of scope 3 emissions for the business, however a high level estimate has been calculated for completeness and transparency.	FIFO flight and bus service spend data is sourced from the internal system that tracks all external spend. Scope 3 emission factors are sourced from the Qantis Scope 3 Evaluator tool, as recommended by the GHG Protocol.	This estimate uses the 'spend-based' method as described under the 'Purchased goods and services' category's calculation methodology.
8. Upstream leased assets	An emissions figure is not calculated for this category as BHP Billiton does not lease upstream assets in our normal operations. This assessment will be periodically reviewed.				
9. Downstream transportation and distribution	Third party transportation services where freight costs are not covered by the business (e.g. under FOB or similar terms).	None	Emissions associated with the freight of our products to customers are of increasing interest as a component of BHP Billiton's supply chain.	Data is sourced from BHP Billiton's Freight team, including tonnage, loading and destination ports for each cargo, and the size of the vessel if freight was by sea (deadweight). Factors are sourced from vessel-specific 2016 UK Defra Freight emission factors (in tonne.km units)	Product freight emissions are calculated using the GHG Protocol's 'distance-based' method, as described for the 'Upstream transportation and distribution' category. For some FOB cargoes, destination ports are not available and an assumption is used based on known product market locations by customer.
10. Processing of sold products	Processing of BHP Billiton's produced iron ore to steel and produced copper cathode to copper wire.	Processing of BHP Billiton's nickel, zinc, gold, silver, ethane and uranium oxide. Excluded as production volumes are much lower than iron ore/copper and a large range of possible end uses apply. Processing/refining of petroleum products also excluded as these emissions are considered	Processing of sold products is one of the most material sources of Scope 3 emissions for BHP Billiton.	Produced volumes in tonnes are sourced from BHP Billiton's publicly available Operational Review Report. Calculations have been performed on an equity basis. For iron ore processing, the scope 3 factors are sourced from the World Steel Association 2013 publication 'Sustainable Steel: At the core of the green economy.' For copper processing, factors are sourced from the European Copper Institute - Copper Alliance's 2012 publication 'The Environmental Profile of Copper Products'.	The GHG Protocol's average-data' method is used, with industry-wide emission factors applied to production volumes (on an equity basis) to estimate emissions. All iron ore production assumed to be processed to steel and all copper metal production assumed to be processed into copper wire for end-use. The copper emission factor is for the full cradle-to-grave life cycle of the end-product. As such there is a small amount of double counting with the scope 1 and 2 emissions generated from copper mining activities

Category	Inclusions	Exclusions	Rationale	Data used	Calculation Methodology
		immaterial compared to their end-use combustion reported in the 'Use of sold products' category.			(which BHP Billiton also reports). This represents 2% of the total scope 3 emissions from this category.
11. Use of sold products	Combustion of BHP Billiton's produced crude oil, natural gas and coal products	None	Use of sold products is one of the most material sources of Scope 3 emissions for BHP Billiton.	Produced volumes in tonnes, barrels or bcf are sourced from BHP Billiton's publicly available Operational Review Report. Calculations have been performed on an equity basis. Factors are sourced from the Australian National Greenhouse and Energy Reporting Determination; scope 1 factors for each fuel are applied as the scope 3 factor to BHP Billiton's on-sold products.	The GHG Protocol's direct use-phase method is used, applied to production volumes (on an equity basis) to estimate emissions. All crude oil, natural gas and coal production is assumed to be combusted. All crude oil produced is assumed to be combusted as diesel as a reasonable basis for emissions calculation.
12. End-of-life treatment of sold products	This category has been identified as immaterial to BHP Billiton's inventory and an emissions figure is not calculated. BHP Billiton's products which are not incorporated into the assessment of scope 3 emissions from 'Use of sold products' include metals and minerals with minimal emissions at end of life. This assessment will be periodically reviewed.				
13. Downstream leased assets	An emissions figure is not calculated for this category as BHP Billiton does not lease downstream assets in our normal operations. This assessment will be periodically reviewed.				
14. Franchises	An emissions figure is not calculated for this category as BHP Billiton does not have franchised operations. This assessment will be periodically reviewed.				
15. Investments	All of BHP Billiton's non-operated investments.	None	Emissions associated with BHP Billiton's investments are relevant in risk	Annual emissions for each of BHP Billiton's investments are sourced from the public domain wherever possible, including government-published data (US	The accounting approach for 'Equity investments' in the GHG Protocol Scope 3 Guidance is used.

Category	Inclusions	Exclusions	Rationale	Data used	Calculation Methodology
			identification and management.	ePa and LEPID registry in Australia) and Sustainability Reports published by the operating entities. Where required, production volumes from investments in tonnes, barrels or bcf are sourced from BHP Billiton's publicly available Operational Review Report.	Scope 1 and 2 emissions for each investment (which form the basis for scope 3 emissions from BHP Billiton) are sourced from publicly available information. If the available figure is for a previous reporting year, it is adjusted for the current year's production levels. This approach covered approximately 85% of the emissions reported for this category. For investments which do not have publicly available emissions data, the emissions intensity from a similar operation in BHP Billiton's portfolio is applied to the current year's production to generate an estimate.
16. Other (upstream)	An emissions figure has not been calculated for this category; no other upstream scope 3 emissions sources have been identified.				
17. Other (downstream)	An emissions figure has not been calculated for this category; no other downstream scope 3 emissions sources have been identified.				