Basis of Reporting: Greenhouse Gas (GHG) emissions data and energy usage

1) Our general reporting principles

Kenmare has sought to ensure that:
- The reported data accurately reflects our performance and serves the general needs of the report's users
- The data is meaningful and consistent with the definitions, scope and boundaries stated in these Reporting Criteria
- Any specific material exclusions are stated and explained
- We use consistent methodologies year to year wherever possible and unless otherwise stated to allow for sustainability performance comparison over time, any material changes in measurement methodologies versus the previous reporting year are made clear
- We are clear regarding the use of assumptions we make and regarding our measurement and calculation methods
- We report transparently such that the report's users can have confidence in the integrity of the data and information we report

1) Introduction & Scope

The Kenmare Sustainability Report 2021 ("the Report") provides and information for the period 1 January 2021 to 31 December 2022 and covers the Moma Mine, Kenmare's only mining asset, which it wholly owns and operates.

2) GHG emissions & energy data

For 2021, the reported data has been sourced from Kenmare Resources operated and controlled site in Moma, Mozambique, where Kenmare sets and enforces the EHS management system and directly leads and supervises the work. Environmental data is focused on atmospheric emissions (Scope 1, 2 and 3 emissions). Atmospheric emissions data is included for Kenmare's Dublin office and two regional offices in Mozambique, Maputo and Nampula. GHGs comprise, in line with the GHG Protocol Corporate Accounting and Reporting Standard (WRI & WBSD, 2004), carbon dioxide (CO2); nitrous oxide (N_2O) methane (CH4).

Kenmare currently reports six categories of Scope 3 emissions. These are:
- Category 1 - Purchased Goods and Services: Suppliers' diesel consumption
  Category 4 - Upstream transportation and distribution
- Category 5 - Waste generated in operations
- Category 6 - Business travel
- Category 7 - Employee Commuting
- Category 7 - Employee Commuting

Energy usage is calculated using DEFRA conversion factors for diesel (all consumers of diesel), LPG and Petrol into MWh. Kenmare's two primary energy sources are grid electricity and electricity generated from the Aggreko diesel powered generators.

Indicator	Description	Data Source and Basis of Calculation	Unit of measure
Atmospheric emissions			
Total direct and indirect energy use	Total amount of energy consumed by the company. Energy sources include electricity and diesel consumed at the Moma mine site and electricity at the Dublin, Maputo and Nampula offices.	Direct meter readings or invoices for diesel and electricity.	Total direct and indirect energy use (MWh)
Total indirect and direct energy use by production	Total amount of energy consumed by Kenmare divided by tonnes of product	Total direct and indirect energy use divided by tonnes of product.	MWh/tonnes of product
Total air emissions (CO2e)	Combines carbon dioxide, nitrous oxide and methane known to contribute to the greenhouse effect and global warming. Total air emissions include Scope 1, Scope 2, and Scope 3 emissions (CO2e).	See definitions of Scope 1, 2 and 3 below. Methane (CH_4) and Nitrous oxide (N_2O) are converted into tonnes of CO2e by multiplying the tonnes of gas by their global warming potential.	Total air emissions (CO2e)
Carbon intensity per tonne of product	Measure of how much CO_2e is associated with the production of a tonne of product.	Total CO2e (Scopes 1, 2 and 3) divided by unit production. Total CO2e (Scopes 1 and 2) divided by unit production.	Tonnes of CO2e per tonnes produced
Carbon intensity per tonne mined (Scope 1 and 2 tonnes CO2e/tonne of excavated ore)	Measure of how much CO_2e is associated with the excavation of a tonne of ore.	Total CO2e (Scope 1 and 2) divided by total tonne of excavated ore. Tonnes of excavated ore is captured in reports from Mine Planning (Jessica Lopes)	Tonnes of CO2e per tonnes of excavated ore

Scope 1, 2 and 3 GHG emissions sources

Scope	Emissions source	Measurement and data collection process	Value of measure
Scope 1 emissions	Diesel consumption	Diesel consumption is taken from metre readings on the equipment, fuel invoices from the filling stations and from the monthly invoices from supplier. The emissions conversion factor used is 2.70553 kg of CO2e per litre of Mineral diesel, as per Defra 2021 guidelines. Equipment and vehicles that consume diesel are: • The Mineral Separation Plant (source: flow metre readings) • Company vehicles (cars and buses) (source: Fuel Management System (FMA). Flow metres on curb side pumps & flow metres on controls though which bowsers (storage units) get filled. When vehicles and Heavy Mobile Equipment vehicles are filled up they use a tag system, linking driver to vehicle, distance travelled etc.) • Shore Services – Equipment tags which piece of stationary equipment is filled when bowser tank is filled up. • Diesel generator (Aggreko) for back up energy supply (only used certain months of the year) (source: flow metre readings) • Transhipment vessels (Bronagh J, Peg & Sofia III) (source: dipper readings) • Heavy Mobile Equipment (dozers, front end loaders etc) (source: FMA) • Unaccounted fuel – delta between consumption & FMA consumption. Metre readings considers temperature effect on fuel quantity. Unaccounted fuel made up of errors (in equipment, or flow metres not calibrated/operational) & theft.	Litres of diesel / kg CO2e
	Petrol	The Defra 2021 emissions factor of 2.19352 litres / kg CO2e is used.	Litres of Petrol / kg CO2e
	Liquid Petroleum Gas	The Defra 2021 emissions factor of 2939.29 tonnes / kg of CO2e is used.	Tonnes of LPG / kg CO2e
	Fugitive emissions from refrigerants	**Fugitive Emissions:** Refrigerants are used for air conditioning units and refrigeration. Emissions are collected from the logbook of refrigerant gas deployed and the following Defra 2021 emissions factors are used: R-134a = 1,430 kg/kg CO2e R-410a = 2,088 kg/kg CO2e R22 = 1,810 kg/kg CO2e	Kg of refrigerant gas /kg CO2e

	Waste emissions	**Landfill data**: Waste from camp and mining plants are taken to a centralised landfill site, which is owned and operated by Kenmare. Kenmare's supplier captures data from all locations across site on a monthly basis. Waste is measured as total waste separated by recycled waste and non-recycled waste measured in tonnes. The landfill site is currently undergoing repair and therefore waste is being stored by the side of the landfill site. As this waste has not reached its end destination, reporting has yet to commence. **Recyclable waste:** Kenmare sorts plastic, aluminium cans, and glass bottles for recycling. Kenmare is currently storing recyclable waste at Kenmare's landfill facility. Once enough volumes are reached to make it commercially viable to transport this waste, it will be transported to Maputo for recycling. As this waste has not reached its end destination, reporting has yet to commence.	Not currently reported.
	Sewerage system	**Sewerage:** Kenmare owns and operates its own sewerage taking raw sewage from the camp (which accommodates approx. 1,200 people) into a centralised sewerage where it is processed and used as part of the land rehabilitation process. Currently, Kenmare does not have the tools to be able to measure the quantity of sewerage being processed by the plant. Additionally, sewerage is processed at both Wet Concentrator Plant B and the Mineral Separation Plant which Kenmare owns and operates. Data on the volumes of sewerage have yet to be measured.	Not currently reported.
Scope 2 emissions (Market-based)	Purchased electricity from the grid for site operations Purchased electricity from electricity providers in Dublin, Ireland	**Moma (mine site) electricity:** Electricidade de Moçambique (EdM), Mozambique's state-owned energy company supplies the Moma Mine with electricity powered by the Cohora Bassa dam which is therefore hydroelectric. EdM has provided a statement confirming 100% of electricity is hydro powered and therefore an EF of 0 tCO2e/KWh is applied. Dublin office: our energy provider supplies electrical energy and heating to the Dublin office. Invoices confirm the energy source is renewable, and that an emissions factor of 0 tCO2/KWh should be applied.	KWh / tCO2e
Scope 3 Emissions	Category 1 - Purchased Goods and Services: Suppliers' diesel consumption	**Third party supplier diesel consumption:** This covers transportation of goods and services purchased or acquired by Kenmare, but not under Kenmare's direct operational control. Data currently collected via FMA. The emissions conversion factor used is 2.70553 kg of CO2e per litre of Mineral diesel, as per Defra 2021 guidelines.	Litres / kg CO2e
	Category 4 - Upstream transportation and distribution	**Upstream transportation & distribution:** Cargo transporting product paid for by Kenmare to customer destinations around the world. To estimate the emissions from upstream transport and distribution, information is researched on each vessel; it is then categorised as a general cargo ship or bulk carrier and assigned a dead weight tonnage (dwt).	Kg CO2 / tonne / km travelled

		Emissions factors are applied to the vessel according to its categorisation and its weight (source: Defra 2021 - Freighting Goods). **General Cargo** 10,000_ dwt 0.01207 5,000-9,999 dwt 0.01602 0-4,999 dwt 0.01323 Average 0.01323 **Bulk Carrier** 60,000-99,999 dwt – 0.00416 35,000-59,999 dwt – 0.00578 0-9,999 dwt 0.00354 Average 0.00354 The Km travelled is multiplied by the relevant emission factors from the vessel and its dwt, and then multiplied by the tonnes of cargo transported.	
	Category 5 - Waste generated in operations	**Waste Disposal (municipal)** **Used Oil:** Selected Supplies (supplier) reports on the amount of used oil removed offsite for recycling, measured in litres. An EF of 21.29 kg CO2e per tonne of waste is applied (source: DEFRA 2021 – density of Waste Oil Fuel properties tab – KG/m3). **Hazardous Waste:** Enviro-Serve (supplier) measures Hazardous Waste in KG. As a breakdown of the type of Hazardous Waste is not reported, an average Emission Factor is created using the EF applied to batteries, used oil, paint tins, oil tins, hydrocarbons, materials contaminated with hydrocarbons and expired chemicals. This average EF is 270.70 kg CO2e / tonne of waste.	Kg/tCO2e
	Category 6 - Business travel	**Business Travel:** Corporate Traveller (supplier) captures all flights booked by staff travelling to and from site as business travel. Flights are categorised based on the distance travelled and the class of the flight (business or economy). The KM travelled are multiplied by the respective emissions factors (see below).	Km travelled / kg CO2e

| | | Short haul is categorised as up to 3,700 km
Long haul is categorised as over 3,700 km
EF are taken from DEFRA 2021 – Business travel air (including the indirect effects of non-CO2 emissions):
Short-haul Economy Class   0.15102 km / kg Co2e / passenger
Short-haul Business Class   0.22652 km / kg Co2e / passenger
Long-haul Economy Class   0.14787 km / kg Co2e / passenger
Long-haul Business Class   0.42882 km / kg Co2e / passenger | |
| | Category 7 - Employee Commuting | **Employee Commuting:**
Chartered flights are classed as employee commuting. There are two separate charters:
1) from Johannesburg, via Maputo, to Beira to Moma
2) from Nampula to Moma/Topuito
Both charter flights were calculated using the fuel-based method (GHG Protocol - Scope 3), multiplying the total fuel consumed by EF 2.54514 litres / kg CO2e (DEFRA 2021 – Aviation Turbine Fuel).

In addition, flights taken by our staff on rotational shifts are included under employee commuting. Rotator flights are included using the distance-based method, where total passenger-km in the aggregate across all flights are multiplied by the Defra emissions factors for long-haul and short-haul flights, per Business Travel methodology above.

All flight distances worked out using airmilescalculator.com, with back-and-forth flight legs presumed to have the same distance (i.e., not accounting for slight difference in routes or presence of headwind/tailwind). Long-haul flights were calculated manually using the same distance-based method, as these flights were far fewer in number. | Litres aviation fuel / kg CO2e

Km travelled / kg CO2e |

| Downstream transportation & distribution | **Downstream transportation & distribution:**
Cargo transporting product paid for by Kenmare's customers to their sites around the world.
To estimate the emissions from upstream transport and distribution, information regarding each vessel is categorised into either a general cargo ship or bulk carrier and a dead weight tonnage (dwt) is assigned to it. Emissions factors are applied to the vessel according to its categorisation and its weight (source: Defra 2021 - Freighting Goods).

General Cargo
10,000_ dwt 0.01207
5,000-9,999 dwt 0.01602
0-4,999 dwt 0.01323
Average 0.01323

Bulk Carrier
60,000-99,999 dwt – 0.00416
35,000-59,999 dwt – 0.00578
0-9,999 dwt 0.00354
Average 0.00354

The Km travelled is multiplied by the relevant emission factors from the vessel and its dwt, and then multiplied by the tonnes of cargo transported. | Kg CO_2 / tonne / km travelled |

Currently out of Scope	Land Clearance, from removal of vegetation ahead of the planned mine path.	Land Clearance is provided in monthly reports provided by mine planning. The emissions associated with land clearing are estimated by multiplying the tonnes of carbon stored in each type of land cleared by a specific conversion factor applicable to each land type, e.g. Secondary Savannah, Dry Thicket etc. Kenmare's emissions data relating to land clearance have been temporarily removed, as we work to align our reporting from this emissions source with new GHG Protocol guidance from the WRI and WBCSD. Land type categories: • Secondary Savanna - 10.8 tC/ha • Dry Thicket - 43 tC/ha • Tropical dry forest - 77.8 tC/ha • Wetland - TBC • Agricultural land - TBC • Cashew woodland - 73.99 tC/ha	Not currently measured