

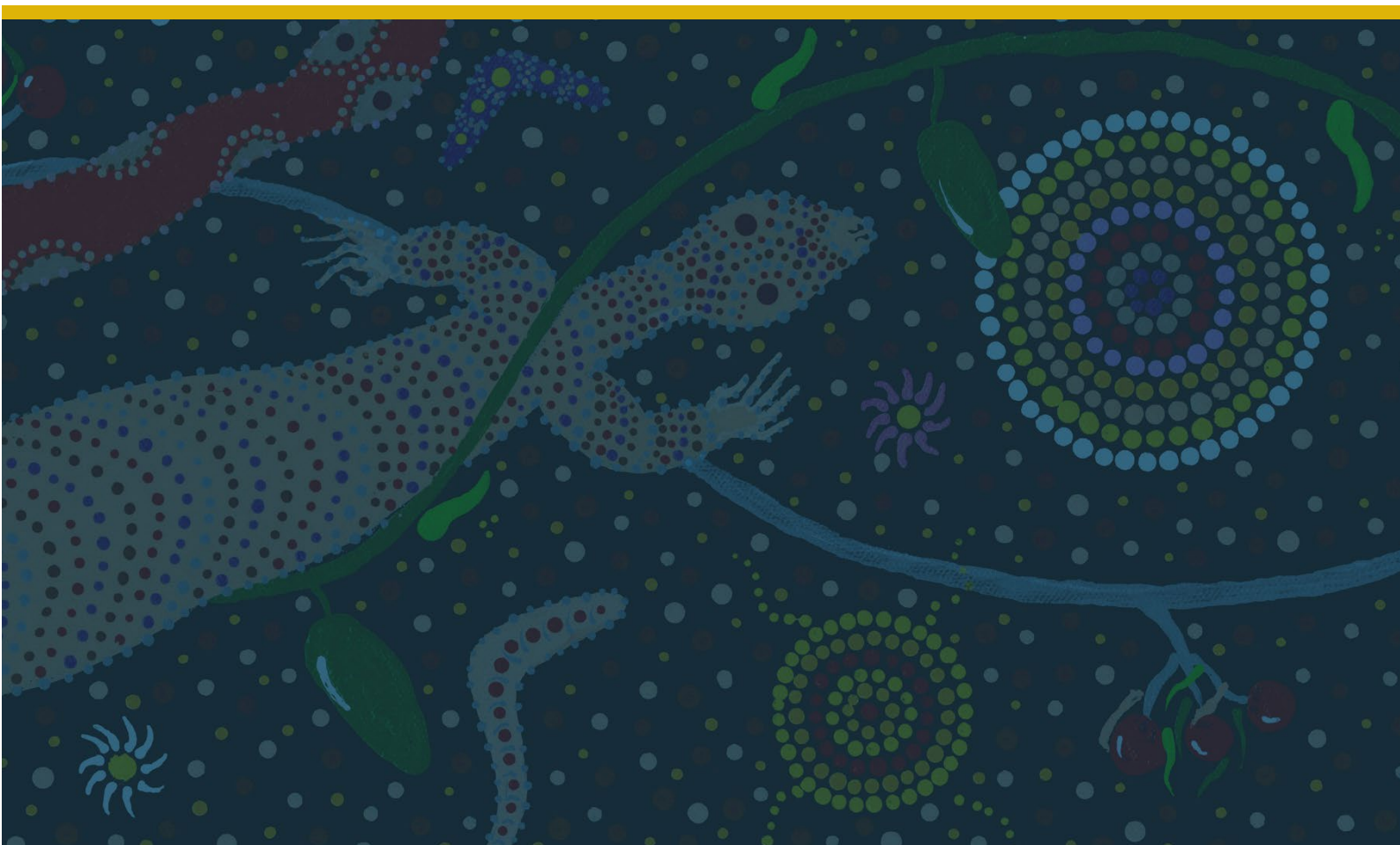
GREENHOUSE GAS MANAGEMENT PLAN

KALGOORLIE CONSOLIDATED GOLD MINES

FIMISTON GOLD MINE OPERATIONS EXTENSION (STAGE 3)

FIMISTON SOUTH PROJECT

REVISED PROPOSAL



GREENHOUSE GAS MANAGEMENT PLAN

Document Reviews

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1. EXECUTIVE SUMMARY

Proposal name	Fimiston Gold Mine Operations Extension (Stage 3) and Mine Closure Planning: Revised Proposal - Fimiston South Project (FS Project)
Proponent name	Kalgoorlie Consolidated Gold Mines Pty Ltd (fully owned by Northern Star Limited)
Proposal description and scope	<p>The Fimiston Operation is located adjacent to the City of Kalgoorlie-Boulder approximately 600 kilometres (km) east of Perth, Western Australia. On average, the operation produces ~500,000 ounces of gold each year and has a current operating mine life up until 2027 with ore processing expected to continue until 2034.</p> <p>The revised proposal is to implement a cutback to the existing Fimiston Open Pit at the southernmost extent, utilising similar mining methods as to those currently employed in the open pit. The cutback will allow for both the widening and deepening of the open pit and extend the operational mine life to approximately 2034 through the implementation of the FS Project.</p> <p>The FS Project will require additional areas for infrastructure, including waste rock dumps (WRD) and tailings storage facilities (TSF). Additional supporting infrastructure will include pipelines, electrical corridors, and roads. Proposed works under the FS Project, although similar in nature to current site activities, may result in additional emissions being reported under the National Greenhouse and Energy Reporting Act 2007 (NGER Act) for the KCGM Fimiston Operations. Once approved, the potential for impact would be limited to the execution phase only.</p>
Purpose of the GHG MP	<p>To meet the requirements of the EPA's How to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans Instructions (April 2023) for a Greenhouse Gas Management Plan (GHGMP) to be prepared as requested via a November 2023 Request for Information (RFI).</p> <p>Ministerial Statement 782 (MS782) Attachment 7 states that greenhouse gas (GHG) emissions will not exceed approximately 440,800 tonnes of carbon dioxide equivalent per annum from Scope 1 and Scope 2 emissions.</p> <p>The FS Project will contribute to reported GHG emissions as part of the Fimiston Operation (NGER entity as required by the NGERs in the reoccurring annual NGER report and online lodgement. The emissions for the FS Project are reported to NGERs in combination with those for the Mt Charlotte Underground project which is not part of the FS Project. This GHGMP focuses on the emissions for the FS Project only.</p> <p>This GHG MP outlines the current GHG emissions of the FS project and explores future GHG emissions estimates for the MS 782 mine disturbance envelope.</p>
Emission estimates	<p>The expected life of FS proposal emissions (FY2034):</p> <ul style="list-style-type: none"> • Scope 1: 1,827,259 tonnes CO₂-e • Scope 2: 771,255 tonnes CO₂-e • Scope 3: 935,000 tonnes CO₂-e <p>The Baseline scope emissions are based on the emissions calculated for FY2024:</p> <ul style="list-style-type: none"> • Scope 1: 207,619 tonnes CO₂-e • Scope 2: 182,851 tonnes CO₂-e

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<p>Trajectory of emissions reductions</p>	<p>Northern Star is pursuing the planned strategic pathway shown below to reduce Scope 1 and Scope 2 Emissions by 35% by 2030 and net zero by 2050. Across the whole organisation and multiple minesites, this would achieve a reduction in GHG emissions from a baseline (1 July 2020) of 930,000 t CO₂-e down to approximately 590,000 t CO₂-e.</p> <p>Reductions in emissions for the KCGM Fimiston Operations will be achieved through the diesel efficiencies, fleet electrification and implementation of two renewable energy projects where the annual Scope 2 emissions can be abated by approximately 260,000 t CO₂-e.</p> <p>For the Safeguard mechanism target (Figure 8) 2024 has been used as the baseline year with a planned reduction trajectory of 4.9% per annum to reach net zero by 2050.</p> <p>Emissions for the project will increase over the next three years and then will decline faster than the 4.9% until 2034. Scope 1 and 2 emissions will reduce from 390,470 to 84,761 t CO₂-e by 2034 (Figure 9).</p>
<p>Other statutory decision-making processes which require reduction in GHG emissions</p>	<ul style="list-style-type: none"> • <i>National Greenhouse and Energy Reporting Scheme (National Greenhouse and Energy Reporting Act 2007 (Cth)).</i> • <i>Emissions Safeguard Mechanism (National Greenhouse and Energy Reporting Act 2007 (Cth)).</i> <p>KCGM Fimiston Operations meets the threshold for the Federal Government's Safeguard Mechanism and currently report annual emissions under this mechanism. Reductions for KCGM Operations will follow the required reductions in intensity under the Safeguard mechanism.</p>
<p>Key components in the GHG EMP</p>	<ul style="list-style-type: none"> • Best practice measures adopted to avoid, reduce, and abate Scope 1 emissions include efficiency measures, fuel reduction and fleet electrification. • Reasonable and practicable measures adopted to avoid, reduce, and abate Scope 2 emissions including a proposed renewable energy facility. • Estimate of Scope 3 emissions. • Outline of other statutory decision-making processes including compliance with the Safeguard Targets Setting and Reporting Mechanism. • Statement and description of five yearly reduction targets until completion of works specified in the Fimiston proposal. • Management strategies to monitor and reinforce progress to net zero by 2050.
<p>GHG EMP reviews and reporting</p>	<p>This GHG EMP will formally be reviewed at a minimum of five years or in accordance with changes in legislation or at other significant triggers/milestones. A range of State and Commonwealth public reporting associated with GHG performance will be maintained.</p>
<p>Proposed construction date</p>	<p>The mine is an ongoing operation, with the new cutback, WRD and TSFs pending environmental approval under the EP Act. Construction will commence upon approval.</p>
<p>GHG EMP required pre-construction?</p>	<p>No</p>

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Proposed project end of life	2034
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2. CONTEXT SCOPE AND PURPOSE

2.1. Proposal name

Fimiston Gold Mine Operations Extension (Stage 3) and Mine Closure Planning: Revised Proposal - Fimiston South Project

2.2. Proponent name

Kalgoorlie Consolidated Gold Mines Pty Ltd (KCGM)

2.3. Proposal description and scope

The Fimiston Operation is located adjacent to the City of Kalgoorlie-Boulder approximately 600 kilometres (km) east of Perth, Western Australia. On average, the operation produces ~500,000 ounces of gold each year and has a current operating mine life up until 2027 with ore processing expected to continue until 2034.

The revised proposal for the FS Project is to implement a cutback to the existing Fimiston Open Pit at the southernmost extent, utilising similar mining methods as to those currently employed in the open pit. The cutback will allow for both the widening and deepening of the open pit and extend the operational mine life to approximately 2034 through the implementation of the FS Project.

The FS Project will require additional areas for infrastructure, including waste rock dumps (WRD) and tailings storage facilities (TSF). Additional supporting infrastructure will include pipelines, electrical corridors, and roads. Proposed works under the FS Project, although similar in nature to current site activities, may result in additional emissions being reported under the *National Greenhouse and Energy Reporting Act 2007* (NGER Act) for the KCGM Fimiston Operations. Once approved, the potential for impact would be limited to the execution phase only.

Alternatives investigated for the FS Project were related to optimal locations for the new TSF and WRD that minimised impacts of flora and vegetation, fauna and the local community. WRD locations were selected as close as possible to mining areas to minimise haulage turnaround time and fuel use. This in turn will contribute to reduced Scope 1 emissions for the project.

The mine will not have a separate construction phase as operations and construction will be occurring at the same time. Emissions have been discussed as a whole for the operation and a separate phase for the expansion has not been separated from the operational emissions calculations.

Scope 1 emissions are generated from the burning of fuel. At KCGM this occurs from the use of diesel fuel to transport ore and waste rock from the pit to the mill or waste rock dump. Other vehicles such as dozers, excavators, light trucks and drill rigs also use fuel and contribute to the scope 1 estimate. Additional emissions are generated from the use of explosives, LPG in processing carbon regeneration kilns and in the gold room furnace, oils and greases for truck maintenance, gasoline and sulfur hexafluoride (in electrical equipment) also contribute to Scope 1 emissions. There is constant construction occurring across the site at same time as mining operations and these cannot be broken into separate phases. The increased truck movements are captured in the tonnes moved/diesel needed calculations for Scope 1.

The source of GHG emissions associated with the FS project include:

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Scope 1 Emissions

- Direct combustion of diesel fuel, primarily used for mining (i.e., haul trucks, excavators, drill rigs, graders, loaders, dozers and in explosives).
- Direct consumption of oils and greases.
- Emissions associated with vegetation clearing associated with loss in capacity to sequester carbon.

Scope 2 Emissions

- Consumption of purchased electricity, used for processing ore and powering fixed or mobile buildings (e.g., crushing and grinding or offices and ablution blocks). Electricity is currently sourced from the South West Interconnected System (SWIS).

Scope 3 Emissions

- Associated with purchased goods and services (i.e., mining equipment, mill components. Carbon-intensive items (e.g. grinding media);
- Associated with capital goods (i.e., mining equipment);
- Fuel- and energy-related activities (not included in scope 1 or scope 2) (mill and maintenance consumables)
- Associated with upstream transport and distribution of purchased goods or services;
- Employee commuting to and from site; and
- Emissions associated with responsible disposal of waste or implementing recycling activities.

2.4. Purpose of the Greenhouse Gas Management Plan

This GHGMP has been prepared in accordance with the Environment Protection Authority (EPA) Environmental Factor Guideline: Greenhouse Gas Emissions (EPA, 2023). The structure and content of this GHGMP are based on the Greenhouse Gas Environmental Management Plan Template (EPA, 2023) to ensure transparency and consistency. The factor objective for Greenhouse Gas Emissions is:

- To minimise the risk of environmental harm associated with climate change by reducing greenhouse gas emissions as far as practicable.

There is a fundamental link between GHG emissions, their effect on the climate and consequential effect on the natural environment and society. Examples of common global issues are loss of life and livelihoods through the impacts of severe weather, loss of flora and fauna species through fire, flooding, and shifting biome boundaries, ocean acidification resulting in coral reef collapses and reduced biodiversity.

GHG emissions from a proposal will be considered by the EPA when they are reasonably likely to exceed:

- 100,000 tonnes of CO₂-e of Scope 1 emissions in any year; or
- 100,000 tonnes of CO₂-e of Scope 2 emissions in any year.

The FS Project does exceed this trigger value and as such has been reporting under the Commonwealth Government's Safeguard Mechanism since 2009.

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3. GHG EMP COMPONENTS

3.1. Emission estimates

Since 2009, KCGM has been required to report on Scope 1 and 2 emissions annually for the Fimiston Operations under the NGER Act 2007. This annual reporting cycle has resulted in a detailed understanding of the sources and quantities of both Scope 1 and Scope 2 emissions associated with the KCGM Fimiston Operations.

- Scope 1 emissions are the emissions released to the atmosphere as a direct result of an activity, or series of activities at a facility level.
- Scope 2 emissions are the emissions released to the atmosphere from the indirect consumption of an energy commodity (e.g., from the use of electricity produced by another facility).

Estimates of GHG emissions from the Project were originally prepared by KPMG (2021) and were then updated with real data from current Safeguard Mechanism reports. The original data was in the Proposal Content Document and has since been largely verified by the actual data as reported to NGERs. The source of emissions associated with the FS project include Scope 1, Scope 2 and Scope 3 GHG emissions.

Scope 1 emissions are generated from the burning of fuel. At KCGM this occurs from the use of diesel fuel to transport ore and waste rock from the pit to the mill or waste rock dump. Other vehicles such as dozers, excavators, light trucks and drill rigs also use fuel and contribute to the Scope 1 estimate. Additional emissions are generated from the use of explosives, LPG in processing carbon regeneration kilns and in the gold room furnace, oils and greases for truck maintenance, gasoline and sulfur hexafluoride (in electrical equipment) and contribute to Scope 1 emissions.

Land Clearing Emissions

Northern Star utilised the Department of Climate Change, Energy, the Environment and Water Full Carbon Accounting Model (FullCAM) to estimate additional t CO₂-e entering the atmosphere through loss of sequestration due to clearing (DCCEEW, 2020). Using the FullCAM tool, based on latitude of -30.46 south and Longitude 121.30 east, carbon mass of trees per hectare and forest debris per hectare (ha) were valued at 21.61 and 11.15 t carbon/ha respectively. Using these values and the total hectares (1,580 Ha) to be cleared for the project, it is estimated that for the life of the project an additional 189,699 t CO₂-e will enter the atmosphere.

LOM Scope 1 and Scope 2

KCGM's Scope 2 emissions result from the emissions intensity of its sources of supply of electricity. An energy balance has been performed to estimate the volumes of electricity (kWh's) coming from each source of supply to meet KCGM's demand for electricity. KCGM's source of supply will be a mix of renewable energy with zero emissions, grid supply, which comes from the SWIS where Scope 2 emissions will depend on the emissions intensity of the South West Interconnected System (SWIS) in each reporting period, and firming supply (to meet any shortfalls in energy supply from the two forementioned sources of supply) from local generation plants in Kalgoorlie. The emissions intensity factor of local generation plants in Kalgoorlie has been estimated based on historical performance when operating on gas.

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Following the introduction of the NGER Act 2007, KCGM has been collating information to support the annual Scope 1 and Scope 2 emissions calculations and report development since 2009. This reporting includes the KCGM operations and the Underground operations.

KCGM sources its main quantity of electricity from the SWIS, with minor electricity being obtained from local generation plants in Kalgoorlie. This source is classified as “off grid” supply in NGERs because it is not connected to the SWIS.

The project does not have construction and operations phases as the project has been operating for many years and the expansion activities will be incorporated into the ongoing operations. Ramp up at the mill will occur gradually over time as improvements and upgrades are completed while continuing to operate. Energy use from increased mill throughput over time will transfer to renewable energy to reduce CO₂ emissions.

Increased Mill Throughput

With the mine expansion there will be increased mill throughput due to optimised plant infrastructure which increases Scope 2 emissions in the short term before the renewables project come online.

Figure 2 below tracks KCGM’s forecast Scope 2 emissions to show these impacts. This shows a potential increase in emissions occurring in FY2027 when throughput is planned to increase. This is abated by renewables that are planned to come online over FY2026-28. There are minor movements in emissions over the forecast period which result from small variations in KCGM’s energy demand year on year.

The annual emissions for Scope 1 and Scope 2 have been estimated over the life of mine until 2034 (11 years). Table 1, Figure 1 and Figure 2 show the current understanding of the emissions inventory estimate of 2024 data (to be reported under the NGER Act) and forms the base case. The 2024 forecast baseline (390,470 t CO₂-e) was used as the most recent indicator of truck movement diesel usage and mill throughput electricity requirements and provides the most realistic starting point. There will most likely be increased milling and haulage and emissions will increase until renewables projects can abate electricity emissions and reduce emissions overall for the Fimiston Proposal (Figure 3 and Table 2).

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Table 1 Inventory of Scope 1 and Scope 2 GHG Emissions Data (estimate for 2024)

Emissions source	Where used	Annual Quantity 2024	Annual t CO ₂ -e	% of Total
Scope 1				
Diesel	Mining Operations: haul trucks, excavators, explosives, drill rigs, and ancillary earthmoving equipment	74,603 kL	202,153	97
LPG	Processing: carbon regeneration kilns and gold room furnace		4,079	<1
Oils and greases	Mining Operations: haul trucks, excavators, drill rigs and ancillary earthmoving equipment		613	< 1
Gasoline	Other: transport energy use		733	< 1
Sulphur Hexafluoride (SF6)	Other: electrical insulators, transformers, circuit breakers, and high voltage switchgear		41	< 1
Scope 1 Total			207,619	47%
Scope 2				
Electricity	Processing: crushing and grinding	397,502,000 kWh	182,851	53%
Total Scope 1&2			390,470	

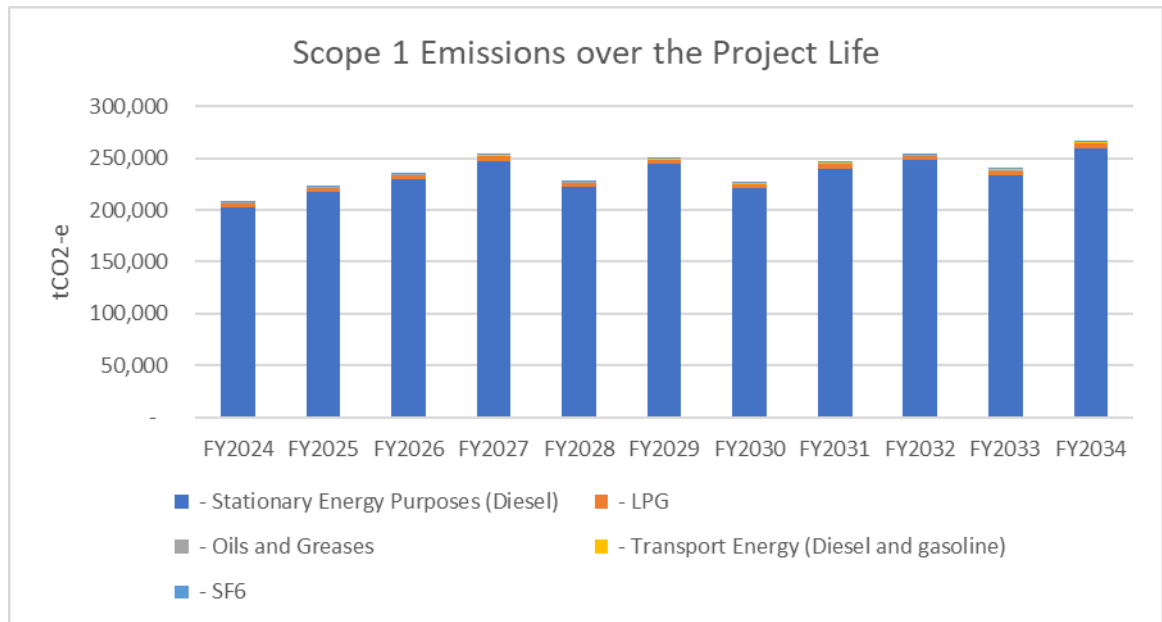


Figure 1 Scope 1 Emissions sources over the project life excluding clearing

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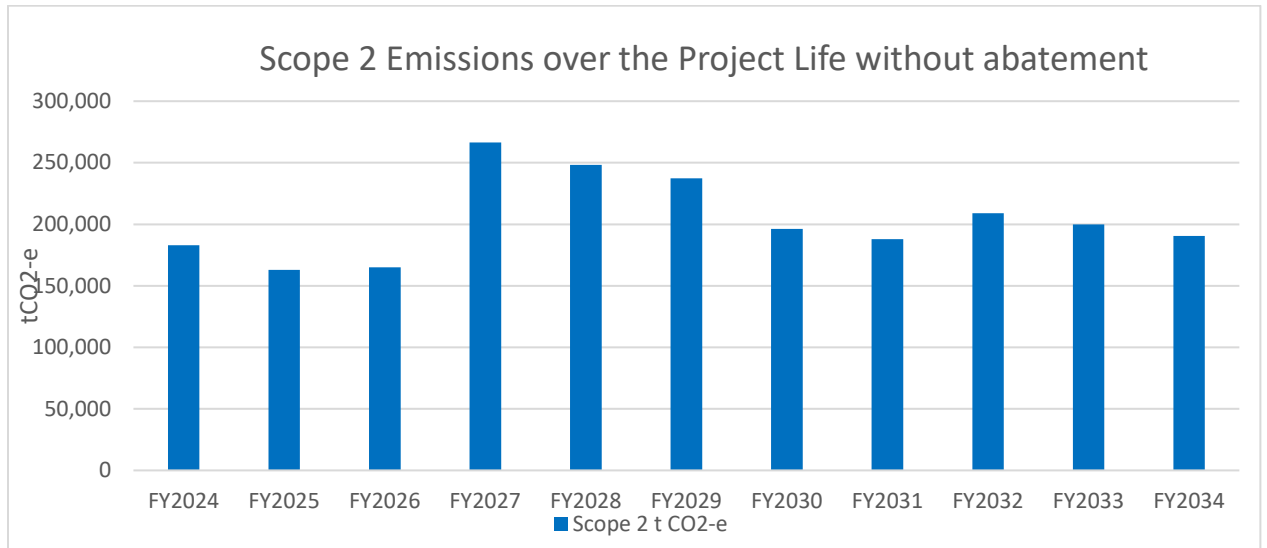


Figure 2 Scope 1 Emissions sources over the project life excluding clearing

Northern Star Resources is developing a large-scale renewable energy project to achieve an overall reduction in KCGM's Scope 1 & 2 emissions by the end of FY2028 (30 June 2028). The project will incorporate a circa 100MW Solar PV Facility and a circa 200MW Wind Farm located on Northern Star Resources held mining tenure in proximity to the KCGM operations. Target commercial operation dates are 1 January 2026 for the Solar PV Facility and 1 July 2027 for the Wind Farm. When completed approximately 80% of KCGM's electricity supply is expected to be supplied by renewable energy.

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Table 2 Forecast Scope 1 GHG Emissions Data

Year	Scope 1 t CO ₂ -e Hydrocarbon Fuels	Fullcam clearing calculation t CO ₂ -e	Scope 1 Abatement t CO ₂ -e	Annual Scope 1 Emissions with Abatement
FY2024	207,619			207,619
FY2025	222,616	63,233	4,181	218,435
FY2026	235,191	63,233	4,324	230,867
FY2027	252,880	63,234	4,629	248,251
FY2028	227,485		5,687	221,798
FY2029	249,612		6,303	243,309
FY2030	226,021		48,984	177,037
FY2031	245,651		126,803	118,848
FY2032	253,558		199,609	53,949
FY2033	239,124		188,157	50,967
FY2034	265,317		209,138	56,179
Totals	2,625,074	189,700	797,815	1,827,259

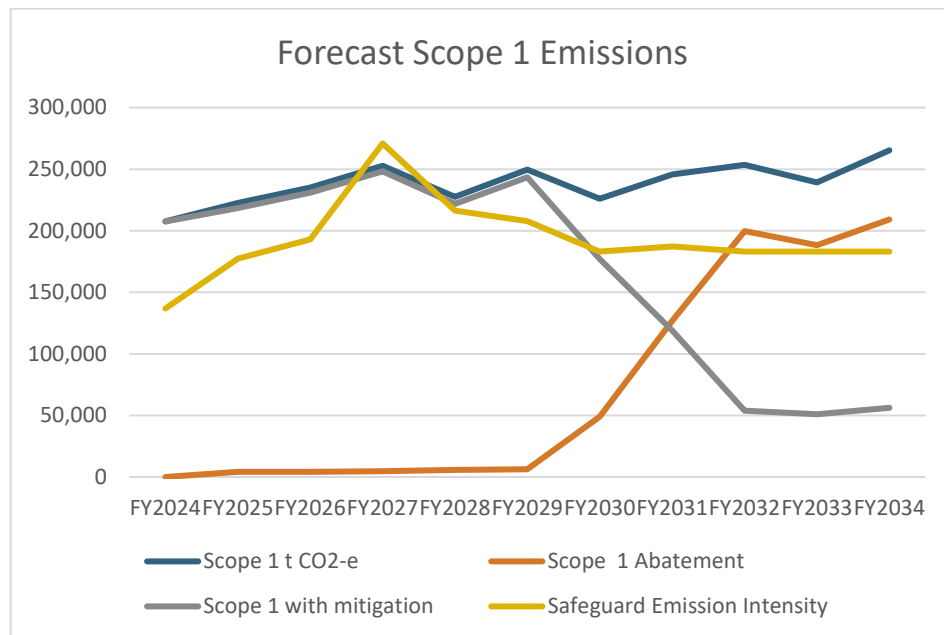


Figure 3 Scope 1 Emissions over the project life

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Table 3 Forecast Scope 2 GHG Emissions Data

Year	Scope 2 t CO ₂ -e Electricity Supply	Renewable Scope 2 reduction	Annual Scope 2 Emissions minus renewables	Annual Scope 1 & 2 Emissions with mitigation
FY2024	182,851		182,851	390,470
FY2025	162,976		162,976	381,411
FY2026	165,111		165,111	395,978
FY2027	266,417	-226,455	39,962	288,213
FY2028	248,357	-211,104	37,253	259,051
FY2029	237,264	-201,675	35,589	278,898
FY2030	196,117	-166,699	29,418	206,455
FY2031	187,945	-159,753	28,192	147,040
FY2032	209,042	-177,685	31,357	85,306
FY2033	199,762	-169,798	29,964	80,931
FY2034	190,544	-161,962	28,582	84,761
Totals	2,246,385	-1,529,496	771,255	2,598,514

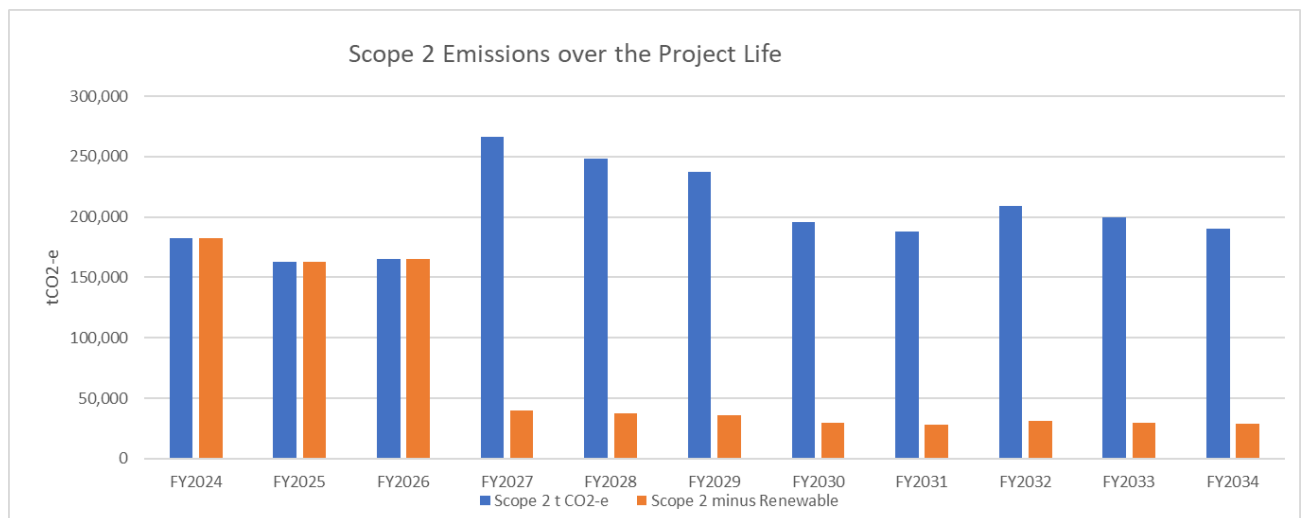


Figure 4 Scope 2 Emissions over the project life with renewables

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Renewables are expected to come on stream during 2026/2027 and Scope 1 mitigations will commence from 2030 as new technology becomes available. Table 4 and Table 5 show the total tonnes of CO₂-e estimated to be generated through Scope 1 and Scope 2 emissions over the LOM and includes scope 1 mitigation and Scope 2 renewables. For the period between 2024 and 2034, diesel consumption was derived from the Life-of-Mine (LOM) forecast, which is used for long term mine planning. This forecast includes expected annual quantities of ore mined, ore processed, and gold produced. Annual averages and total project estimates are in Table 6.

Table 4 Total of Scope 1 and Scope 2 Emissions Estimate over Project Life (including renewables and mitigation)

Greenhouse Gases t CO ₂ -e	2024-2029 (Annual average)	2030-2034 (Annual average)	Total Project 2024-2034	% of Total
Scope 1	228,380	91,396	166,114	70
Scope 2	103,957	29,503	70,114	30
TOTAL SCOPE 1 and 2 EMISSIONS	332,337	120,899	236,228	100

Table 5 Assessment of Scope 1 and Scope 2 Emissions – Average annual and Total Project to 2034 with renewables

Emissions source	Average annual quantity (t CO ₂ -e) ¹	Total for the Project (t CO ₂ -e)
Stationery Energy Purposes (diesel)	160,648	1,767,133
LPG	4,079	44,869
Transport Energy (diesel and gasoline)	733	8,063
Oils and Greases	613	6,743
Other (SF6)	41	451
TOTAL OF SCOPE 1 EMISSIONS	166,114	1,827,259
Electricity (Scope 2) abated by renewables	70,114	771,255
TOTAL OF SCOPE 1 AND 2 EMISSIONS	236,228	2,598,514

¹ Annual emissions have been averaged for the operational phase of the project (2021 to 2034). Emissions quantities decline sharply after 2034 due to reduced mining activity as the project approaches end-of-life).

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Table 6 Assessment of Scope 1 and Scope 2 Emissions – Average annual and Total Project to 2034 with renewables

Greenhouse Gases t CO ₂ -e	2024-2029 (Annual average)	2030-2034 (Annual average)	Total Project Average 2024-2034	Total Project	% of Total
Scope 1 with Mitigation	228,380	91,396	166,114	1,827,259	70%
Scope 2 with renewables	103,957	29,503	70,114	771,255	30%
SCOPE 1 and 2 Emissions with renewables	332,337	120,899	236,228	2,598,514	100%

Scope 3

In addition, to Scope 1 and 2 emissions, there are Scope 3 emissions attributable to the Fimiston Operations overall emission profile. These are considered indirect emissions; that is, they occur outside of KCGM's operational control, generally accepted to include or be as a result/s of manufacturing and transportation of raw materials utilised at the Fimiston Operations by KCGM to undertake the principle prescribed activity (mining and processing). For the implementation of the FS Project, Scope 3 emissions originate from the transportation of consumables (including additional diesel fuels/oils, mill grinding media and processing consumables) and any additional machinery to and from the site.

Northern Star has continued to evolve measurement and analysis of Scope 3 emissions in line with the GHG Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard and supported by Greenbase's environmental accounting team. In financial year 23 review of the supply chain was completed and there was an increase in the number and type of suppliers surveyed. All suppliers to Northern Star during FY23 were assessed for materiality by spend and supplier categories. Supplier activities that were already being captured under the existing Scope 1 and 2 processes were excluded from the Scope 3 assessment to avoid duplication.

Of the fifteen Scope 3 categories listed in the GHG Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard, the following were considered applicable to Northern Star Resources and included in our FY23 assessment (Table 7).

Table 7 Assessment of Scope 3 Emissions – Inclusions and Exclusions

Scope 3 Category	Inclusions	Exclusions
Purchased goods and services	Included mining equipment, mill components. Carbon-intensive items (e.g. grinding media) and water have also been included	
Capital goods	Included as above	

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Scope 3 Category	Inclusions	Exclusions
Fuel- and energy-related activities (not included in scope 1 or scope 2)	Included mill and maintenance consumables	
Upstream transportation and distribution	Included transport of equipment to site	
Waste generated in operations	Included waste generated from the maintenance activities, offices and mill areas	
Business travel		Not included as corporate travel is calculated separately and is apportioned to the corporate Perth office emissions.
Employee commuting		Not included as the majority of KCGM workers live in Kalgoorlie and only travel a few minutes to work.
Upstream leased assets		Not included as equipment is purchased not leased
Downstream transportation and distribution		Not included as gold is produced in small quantities (20-24 tonnes per year)
Processing of sold products		Not included as processing of ore is included in stage 1 and 2 emissions
Use of sold products		Not Relevant as gold has many uses that are difficult to quantify
End-of-life treatment of sold products		Not Relevant as gold does not degrade or rust
Downstream leased assets		Not Relevant
Franchises		Not Relevant
Investments		Not Relevant

A profile of Scope 3 emissions over the lifecycle of the Fimiston Operations is outlined in Table 7 and shown in Figure 3.

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Table 8 Assessment of Scope 3 Emissions – Average Annual and Total FS Project

Scope 3 Category	Average annual quantity (t CO ₂ -e) ²	Total for the Project from 2022-2034 (t CO ₂ -e)
Category 1 - Purchased goods and services	55,157	717,042
Category 3 - Fuel and energy related activities	15,803	205,441
Category 4 - Upstream transport and distribution	1,024	13,312
TOTAL OF SCOPE 3 EMISSIONS	71,984	935,794

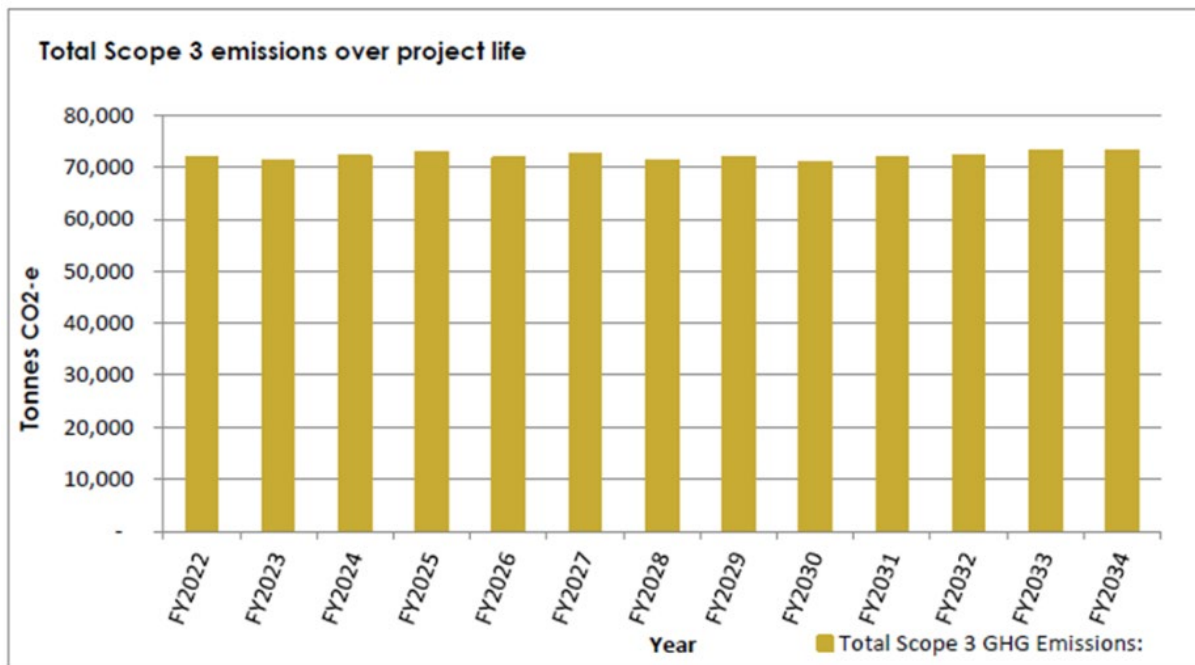


Figure 5 Total Scope 3 emissions over project life

GHG Emitted

Carbon dioxide is the primary source for GHG emissions. For minor sources of Scope 1 emissions (oils and greases, gasoline and leakage of sulphur hexafluoride), the forecast was based on analysis of historical data, which indicated that use in FY 2019 was representative of typical annual use of these materials. The 2019 figure was repeated as an annual figure for the life of the project, with appropriate adjustment for the final years when consumption would be expected to decrease. These minor sources accounted for less than 1% of forecast annual Scope 1 emissions.

² Annual emissions have been averaged for the operational phase of the project (2021 to 2034). Emissions quantities decline sharply after 2034 due to reduced mining activity as the project approaches end-of-life)

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Carbon dioxide has a Global Warming Potential of 1 under the Intergovernmental Panel on Climate Change.

The KCGM Operations Scope 1 & 2 GHG emissions in 2021 were 403,186 t CO₂-e. This increased due to increased production in 2022 to 453,539 t CO₂-e. In 2023 due to efficiencies on site this was reduced to 440,689 t CO₂-e and in 2024 to 390,470 t CO₂-e. This has been used as the baseline for emissions reduction calculations.

Justification

The Safeguard Mechanism Rule commenced on 1 July 2016, imposing maximum emission limits for facilities with more than 100,000 t CO₂-e Scope 1 emissions per annum (emissions baseline), this applies to KCGM Fimiston Operation with a baseline being set at 242,659 t CO₂-e in 2022.

In addition, the Safeguard Mechanism Rule was amended (March 2019) and required emission baselines to expire on 1 July 2020, with facilities operating under the Safeguard Mechanism required to transition to calculated emissions baselines during 2018-2019 and 2019-2020 reporting years. However, in response to the global COVID-19 pandemic emerging, this deadline was extended to May 2020.

Changes were made to the Safeguard Mechanism that become effective from 1 July 2023. The key changes relevant to Northern Star include the requirement for facilities to reduce their Scope 1 Emissions by 4.9% each financial year until 2030, with an objective to reduce net emissions by approximately 30% by the end of this period. Northern Star is already taking steps towards this as a result of its disclosed target reducing company wide Scope 1 and 2 Emissions by 35% (from a 1 July 2020 baseline of 931 kt CO₂-e) by 2030.

Safeguard Mechanism Baselines are the legislated limits on greenhouse gas emissions for Australia's largest industrial facilities. Each facility has a specific baseline, which declines gradually over time. The baseline for a facility is set using the emissions intensity which is based on a combination of industry average and site-specific emissions intensity values.

Emission Intensity refers to the amount of greenhouse gas emissions produced per unit of output (e.g., energy, product, or service). It's a measure of how efficiently a facility or process generates emissions.

Standardised baseline reporting across all recent Sustainability/Climate Reports for Western Australian gold mines defines emissions intensities for gold as tonnes of CO₂ per ounce of gold produced.

Key Assumptions and Uncertainties

The key assumptions and uncertainties within this document are based on findings from annual GHG emission reports completed to date by the KCGM Fimiston Operations. These assumptions include:

- Fimiston Operations NGER reports to date have provided sufficient information on the quantity of emissions and details regarding sources of emitting activities;
- Alterations in the delivery of unplanned work activities due to unanticipated changes such as resourcing requirements or external supply constraints; and

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- Likelihood of occurrence of unforeseen events to occur, which may then cause flow on impacts and disruptions back to mining operations (i.e., pit wall collapse, pandemic, economic conditions).

3.2. Trajectory of emissions reductions

Northern Star is pursuing the planned strategic pathway for all projects in their portfolio to reduce Scope 1 and Scope 2 Emissions by 35% by 2030 and net zero by 2050. This would achieve a reduction in greenhouse gas emissions companywide from the baseline (1 July 2020) of 930,000 t CO₂-e down to approximately 590,000 t CO₂-e using 2024 as the baseline year with a planned reduction trajectory of 4.9% per annum to reach net zero by 2050. This is central to all business and strategic planning, with increased efficiencies and Emissions Reduction incorporated into decision-making integral to all current Operations, future projects, and business development.

Reductions in emissions for only the KCGM Fimiston Operations will be achieved through the implementation of two renewable energy projects (KCGM grid green PPA reducing 79,819 t CO₂-e + KCGM solar and wind reducing 190,092 t CO₂-e) where the Scope 2 emissions can be abated by approximately 260,000 t CO₂-e. Scope 1 emissions will be reduced by gradual electrification of the fleet. **Scope 1 emissions without abatement from 2025-2024 are 2,417,455 t CO₂-e. Abatement of 797,815 t CO₂-e is a 33% reduction. Scope 2 emissions would be 2,063,535 t CO₂-e without abatement. The renewables project reduction of 1,475,131 t CO₂-e represents a 71% reduction in emissions.**

As generated and purchased electricity accounts for 46% of Northern Star's GHG emissions (FY24 Baseline of 390,470 t CO₂-e), this is a key focus area for reducing Scope 1 and Scope 2 emissions.

Safeguard has moved to a process of using a Production Variable Facility-specific Emissions Intensity to determine baselines for reporting Scope 1 emissions. Fimiston has submitted Emissions Intensity estimates for Safeguard approval. These figures have been calculated using a ratio of run-of-mine metal ore processed in tonnes. The default emissions intensity is 0.00859 t CO₂-e/tonne and the requested emissions intensity is 0.01262 t CO₂-e/tonne.

On 22 June 2023 Northern Star announced the Board approval of the KCGM mill expansion which is proposed to increase the capacity of the Fimiston Processing Plant from 13 Mtpa to 27 Mtpa. Part of this expansion will also involve an upgrade to the existing 33 kV power distribution network and the intention is to provide for infrastructure upgrades to introduce renewable energy.

Measures to reduce Northern Star's reliance on fossil fuels used for electricity generation include increasing utilisation of renewable energy, including wind and solar. Energy storage options form part of this solution from both a maximisation of the renewable input and system integration aspect.

This knowledge (and the long mine life at KCGM Operations in particular) enables Northern Star to focus on large-scale multi-decade renewable projects to replace reliance on carbon intensive energy sources, using proven, existing technology to target the 2030 Emissions Reduction.

Figure 4 also showcases the reduction of Scope 2 emissions with renewable abatement. Through the implementation of renewable projects, the Scope 2 emissions can be abated by approximately 260,000 t CO₂-e per annum. The reduction of approximately 260,000 t CO₂-e of Scope 2

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emissions is outlined in Figure 6 when Scope 1 and Scope 2 emissions are combined over the FS Project life.

Total expected emissions over the life of the FS Project can be seen in Section 3.1 and Figure 6 with emissions ceasing in 2034 at the end of project life. Five Yearly Targets are presented in Table 9.

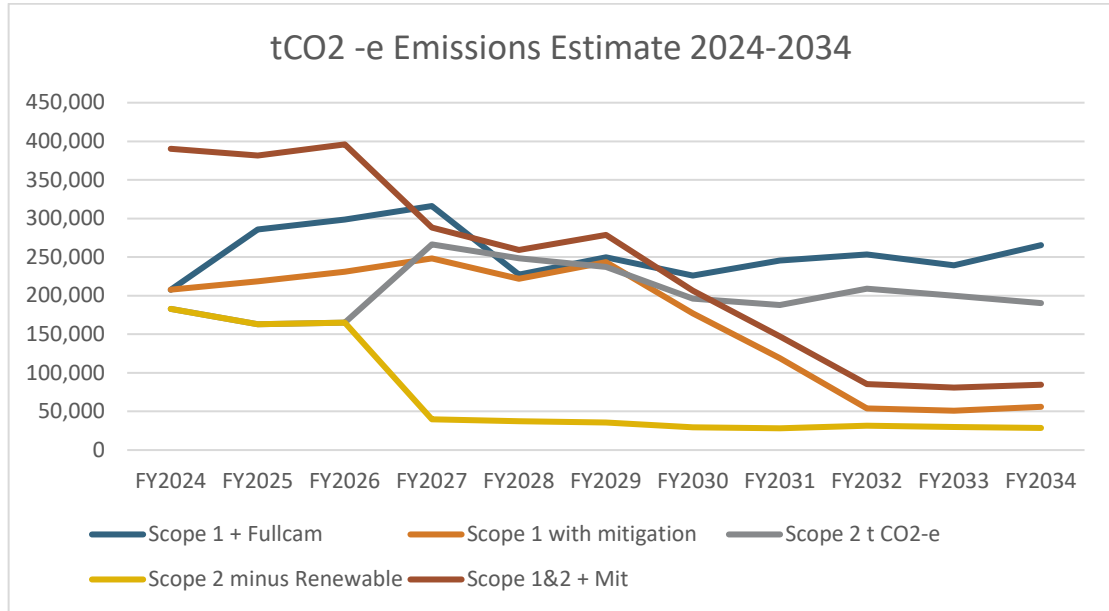


Figure 6 Scope 1 and 2 Emissions over the project life with renewables and mitigation

Table 9 Scope 1 and 2 Interim Five Yearly Targets

Financial Year (FY)	Scope 1 Emissions Targets (t CO ₂ -e) ³	Scope 2 Emissions Targets (t CO ₂ -e) ⁴	Scope 1 and Scope 2 Emissions Targets (t CO ₂ -e) ⁵ excluding clearing
2025-2029	1,165,000	441,000	1,606,000
2030-2034	460,000	148,000	608,000
2035 onwards	0	0	0

3.3. Benchmarking

FS Project emissions were benchmarked against other large gold mining operations in Australia. Mines producing gold as a secondary product in a concentrate - as well as those that produced metallic gold – were included in the assessment. Information was obtained primarily from public

³ Annual emissions have been averaged for the operational phase of the project (2025 to 2034). Emissions quantities decline sharply after 2034 due to reduced mining activity as the project approaches end-of-life)

⁴ Annual emissions have been averaged for the operational phase of the project (2025 to 2034). Emissions quantities decline sharply after 2034 due to reduced mining activity as the project approaches end-of-life)

⁵ Annual emissions have been averaged for the operational phase of the project (2025 to 2034). Emissions quantities decline sharply after 2034 due to reduced mining activity as the project approaches end-of-life)

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reports (e.g., Annual reports). Gold production was also reported in order to give an idea of the scale of the operation (Figure 7).

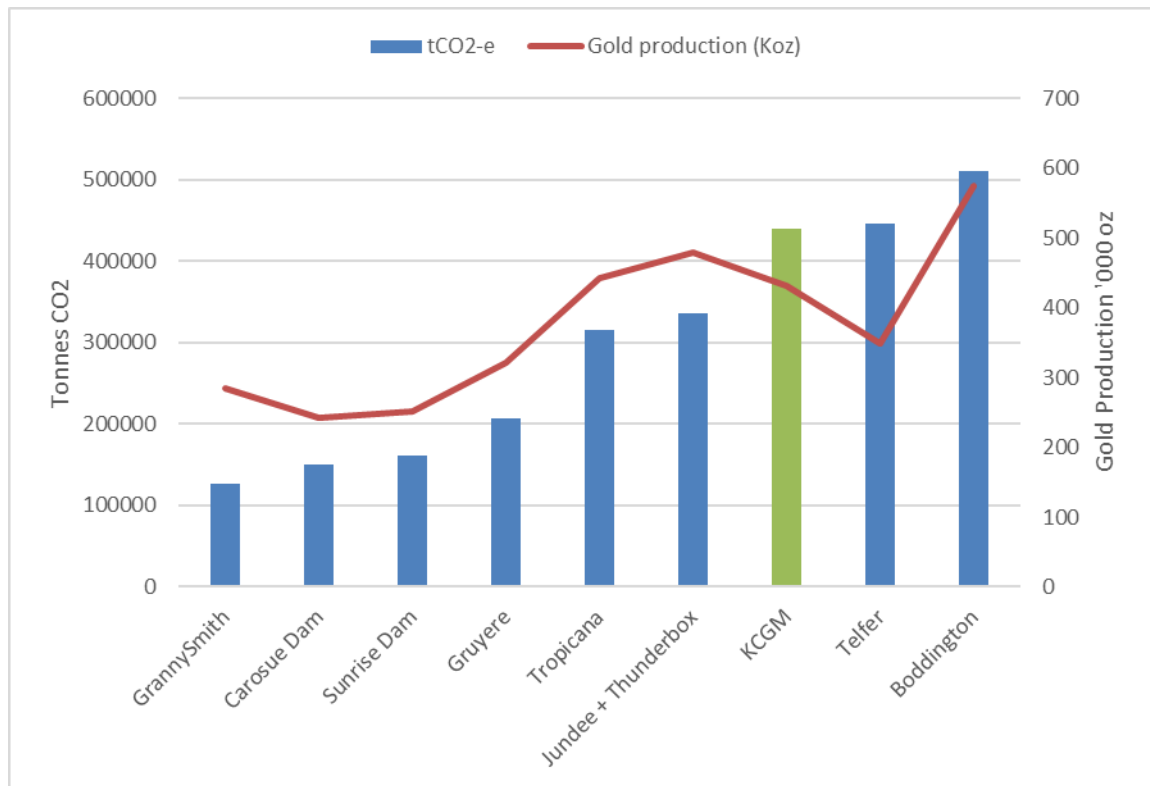


Figure 7 Results of benchmarking

Figure 7 shows a reasonable correlation between total emissions and gold production. Emissions from the FS Project are in line with the size of the project, including for the pit expansion stage of the project (2023) when the quantity of waste rock being removed is high relative to ore production, compared with post-expansion years (2028 and 2032).

Net zero by 2050 targets are applicable to KCGM and will require concerted effort by KCGM over time to reach this emissions target.

Emissions intensity of the project is similar to other large Gold Mining Projects in WA. The average emissions intensity across the gold miners was 0.81 t CO₂-e/oz with five of the eight mining operations listed coming under this value. Kalgoorlie Operations ex. KCGM was the best performing site with an emissions intensity of 0.59 t CO₂-e/oz, however, it is noted that this site is a smaller operation, with less gold produced and it uses purchased electricity from the grid. KCGM operations at 1.02 t CO₂-e/oz is higher than average but well below Telfer at 1.27 t CO₂-e/oz.

With application of electrification and increased mill optimisation the emissions intensity will reduce over time.

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Table 10 2023 Benchmarking results for Western Australian Gold Mines

Company	Site	Operation type	Commenced operations	2023 GHG emissions (ktCO ₂ -e)	2023 gold production (koz)	Emissions intensity (tCO ₂ -eoz)	Electricity generation (approx%)
Anglo Gold Ashanti Australia	Tropicana ⁶	OP/UG	2012	323	310	1.04	Natural Gas – 99% Diesel – 1%
Gold Fields	Gruyere ⁷	OP	2019	207	321	0.64	Natural Gas – 91% Solar – 9% Diesel – 0.1%
Newcrest	Telfer ⁸	OP/UG	1977 / 2004	445	349	1.27	Natural Gas – 99.7% Diesel – 0.3%
Newmont ⁹	Boddington	OP	1987 / 2010	884.92	745	1.19	Purchased Grid Electricity (non-renewable) – 95% Diesel – 5%
Northern Star ¹⁰	Yandal	OP/UG	2016	336	480	0.70	Natural Gas – 95% Diesel – 5%
	KCGM	OP/UG	1989	440	432	1.02	Purchased Grid Electricity (non-renewable) – 95% Diesel – 5%
	Kalgoorlie Operations ex. KCGM	OP/UG	1993	95	161	0.59	Purchased Grid Electricity (non-renewable) – 95% Diesel – 5%
	Carosue Dam	OP/UG	2010	150	243	0.62	Natural Gas – 98% Diesel – 1% Solar – 1%
		Average				0.81	

A review of other gold mine operators' GHG reduction initiatives through their company commitments provides a useful comparison to determine if KCGM's commitments are similar. Table 10 provides a comparison of KCGM's GHG reduction targets and projects compared to similar sites in WA.

⁶ Operational Profile 2023, Tropicana – Australia, AngloGold Ashanti.

⁷ Climate Change Report 2023, Gold Fields Limited

⁸ 2023 Sustainability Report, Newcrest Mining Limited.

⁹ 2023 Climate Performance Update – Performance Data, Newmont Corporation.

¹⁰ Sustainability Report FY2023 – Climate Change, Northern Star Resources.

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Table 11 GHG Reduction Targets and Renewables Comparison

Company	Site	2030 Reduction Target	2050 Reduction Target	Renewables / Projects
Anglo Gold Ashanti Australia	Tropicana	30% reduction	Net Zero	Expected commissioning 2025 - 24 MW wind farm, 24 MW solar farm and 14 MW battery storage system.
Gold Fields	Gruyere	50% emissions reductions in Scope 1 and 2 emissions by 2030 from a 2016 baseline, 10% reduction in Scope 3 emissions by 2030 from a 2022 baseline.	Net Zero	Commenced 2022 – 13 MW solar, 4.4 MW battery storage. Prefeasibility study for 66MW wind, 36MW (total) solar and 35 MW (total) battery storage.
Newcrest	Telfer	30% reduction	Net zero	No renewables plan but propose to expand the capacity of natural gas power generation for expansion project.
Newmont	Boddington	30% reduction	Net zero	Investigating wind and solar projects.
Northern Star	Yandal	35% reduction	Net zero	Jundee has recently commissioned 17MW of solar and has the first of 4 wind turbines installed. The full facility will come on line ~Dec-24 with an expected decrease of more than 50% in Scope 2 emissions. Thunderbox has 30-40MW solar facility in planning phase.
	KCGM	35% reduction	Net zero	Commitments to 100MW Solar farm and 200MW Wind farm to commence in 2027. Investigating efficiencies and electrification of mining fleet.
	Kalgoorlie Operations ex. KCGM	35% reduction	Net zero	No committed renewables plans in near future.
	Carosue Dam	35% reduction	Net zero	Completed 2022 – 6.3MW solar.

This demonstrates that KCGM's targets of a 35% reduction by 2030 and net zero by 2050 are the same or better than similar gold mines within WA.

Gruyere and Carosue Dam were the only sites that have operational renewables projects, however, when the Kalgoorlie Renewables project is commissioned, it will have the highest renewable power generation and Scope 2 emissions can be offset by approximately 260,000 t CO₂-e. To date, other companies such as Newcrest and Newmont do not have committed plans for renewable energy projects at the sites listed above.

Based on the information above, while GHG reduction targets are similar, the GHG minimisation steps undertaken by KCGM are significantly better than other companies with similar aged mines.

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3.4. Scope 1 - Mitigation measures

Continuous improvement to reduce emissions over the implementation life of the FS Project (project execution), through the consideration of measures which show actual ability to improve overall performance delivery (lowering emissions).

Best practice design and operational measures

Mining of ore uses contemporary excavator and transport by haul truck. Other mitigation measures are being investigated as technology improves. Battery electric haul trucks have been investigated though current technology solutions were found to have too short an operative period between charges. Northern Star is a member of several research initiatives to develop solutions for mobile fleet electrification. The Fimiston Proposal is an expansion to the KCGM Operations and improvements are continually being investigated to improve efficiency and to reduce fuel use, which is a major cost to gold production. Whilst longer term electrification solutions are developed, short term mitigation measures being implemented by the proposal include:

- Avoidance of emissions by upgrading the fleet of 40 mechanical drive haul trucks from the 793C to the 793F model. This has been modelled and expected to result in a noticeable direct increase in fuel efficiency, and reduction of associated emissions per tonne. The updated BSFC (Brake Specific Fuel Consumption fuel map) for the proposed new fleet indicates a reduction in fuel burn by 1-4% when compared with the existing vehicles (i.e. an average 2% savings). The engine fluid and filter change intervals for the new engines has doubled when compared to the existing 793F fleet. This results in reduced waste of oils and consumables.
- Similar reduction of emissions by replacing six underground vehicles with Tier 1 diesel engines with more efficient Tier 4 engines; resulting in a noticeable decrease of associated emissions per tonne in some underground areas.
- KCGM have recently replaced 47 aging diesel mobile lighting plants with lighting plants which operate as LED lighting plants to safely and practically implement both continuous improvement within the workplace and opportunities for emission reduction/s. The common issue with earlier equipment models is the cost of maintenance and availability of spare parts is becoming increasingly more difficult and expensive to procure. This flows onto impacts to the mining schedule (production losses through equipment downtime), impacts to maintenance schedules (due to supplier constraints and long lead estimated time of delivery). The new generation of LED lighting plants offer a fuel saving of over 80% compared to the current models used on site. This is expected to reduce diesel consumption in the lighting plants from the current 10-11 litres/hr to 1.1 litres/hr, resulting in savings of \$1.2M per year.

Additional best practice reduction measure commitments include:

- Reducing emissions by upgrading the plant over time as newer and more efficient equipment becomes available.
- Haulage optimisation studies targeting minimisation of haul distance and energy requirement over the life of the mine.
- Ensuring operators and managers implement machinery optimisation during all surface and underground activities; that is the operation within the specified manufactures specifications to safely maximise a sustainable output. This would include:
 - Monitoring diesel usage each shift or swing.
 - Monitoring total fuel usage per tonne.

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- Ensuring quality time is spent investing in trainees on new equipment, to develop sound and sustainable operational techniques.
- Looking for and encouraging efficiency discussions.
- Investigating any new developments or improvements to diesel particulate matter filters (DPM) or other alternative technologies to encourage further reduce overall reliance on straight combustion engines.
- KCGM to continue monitoring day to day activities and identify potential studies to support site or corporate decarbonisation strategies; may include feasibility studies with scopes in excess of a single operation (national or global scope).
- Preparation of an energy management plan
- Fostering an embedded energy management culture
- Energy efficiency integrated into business systems and design and processes.
- Driver training to reduce fuel use includes shutting down when at idle, correct gear changes and operation system integrity checks.

Emissions abatement options are quantified in Table 12. Northern Star is investigating carbon farming to offset or reduce greenhouse gas emissions if required.

Table 12 Scope 1 Emissions Mitigation Options

Mitigation option	Timing	Abatement Emissions Targets (t CO ₂ -e)
Continual improvement in operating practises including: <ul style="list-style-type: none"> • Avoidance of material rehandling, including progressive rehabilitation as per the Mine Closure Plan (KCGM, 2022) • Mine design and planning - optimise haulage routes, blasting patterns and explosive usage • Haul road construction - low rolling resistance, well formed and maintained roadways 	Ongoing	TBC
Fuel reduction / substitution <ul style="list-style-type: none"> • Investigation of fuel catalysts / additives • Hydrogen fuels - including partial injection systems • Use of renewable diesel products • Upgrades to more efficient combustion engines 	2025-2034	Average abatement per annum of 4,300 t CO ₂ -e Total abatement 42,806 t CO ₂ -e
Fleet Electrification <ul style="list-style-type: none"> • Loading units (shovel, excavators, wheel loaders) • Haulage units • Drilling units • Dewatering pumps • Ancillary fleet (water carts, dozers, grades, light vehicles) 	2028-2034	Average abatement per annum of 150,000 t CO ₂ -e Total abatement 204,575 t CO ₂ -e

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3.5. Scope 2 - Mitigation measures

Electricity is a major cost and Northern Star is also investigating the potential for reducing emissions by improving plant efficiency and utilising renewable energy, specifically:

- Contracting green power from a solar and wind farm development/s in the Eastern Goldfields Region that would supply electricity directly to KCGM behind the meter (BTM). The project will incorporate a circa 100MW Solar PV Facility and a circa 200MW Wind Farm located on Northern Star Resources held mining tenure in proximity to the KCGM operations. Target commercial operation dates are 1 January 2026 for the Solar PV Facility and 1 July 2027 for the Wind Farm. When completed approximately 80% of KCGM's electricity supply is expected to be supplied by renewable energy.
- Power Purchase Agreements (PPAs) with grid power suppliers for GHG emissions reduction.
- Developing a business plan to repower existing thermal firming assets with newer more fuel-efficient technology. This includes battery energy storage or synchronous condenser technology to minimise thermal run time for capacity or grid stability support.
- Fimiston Processing Plant revitalisation project has considered design efficiency opportunities to minimise power usage, replacing older equipment with more efficient new equipment and improving the efficiency of the processing stream.
- Removing islanded thermal generation units by connecting to the lower emission site distribution network or changing to a hybrid unit that incorporates renewable generation.

KCGM consumes significant quantities of electricity from the SWIS and Northern Star intends to contract green power from a wind farm developer/s through the Wholesale Electricity Market (WEM) to reduce its Scope 2 emissions.

Emission reduction measures are evaluated against social, cultural, environmental and economic parameters. Northern Star has restricted access to land that is held by others and detailed multi-criteria analysis is used to select suitable mitigation measures.

Graphs showing the change in emissions due to the utilisation of renewables are in Section 3.2.

3.6. Scope 3 - Mitigation measures

The World Gold Council confirmed that carbon footprint from gold's downstream (Scope 3) uses are relatively small. Gold's GHG emissions from its total downstream product processing represents approximately 1% of total with the overwhelming majority originating from the jewellery manufacturer industry. The largest contributor to the Scope 3 emissions is from Category 1 Purchase of Goods and Services (Table 7). Northern Star will minimise Scope 3 emissions by continuing to support local businesses to deliver services and to employ locally to assist delivery of social governance objectives and practically reduce Scope 3 emissions associated with:

- Special transports;
- Additional staff relocation (from interstate or internationally);
- Reduce or control fly in-fly out as sole fix to resourcing;
- Ensure corporate visits to site are value adding;
- Continue to embrace online meetings and conversations (reduction of travel for a meeting);
- Sourcing: Work with suppliers to source low carbon capital goods from manufacturers. Consider factors such as material sourcing, manufacturing techniques, and transportation methods;

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- **Transportation Optimization:** Optimize transportation logistics for capital goods to reduce emissions associated with their delivery. Consolidate shipments, choose low-emission transport modes, and utilize efficient routing strategies;
- **Maintenance and Upkeep:** Implement regular maintenance schedules and proper upkeep of capital goods to ensure optimal performance and longevity, reducing the need for premature replacements and associated emissions from manufacturing new equipment; and
- **Reuse and Recycling:** Implement policies to promote the reuse and recycling of capital goods components and materials. Extend the lifespan of equipment through refurbishment or repurposing, and ensure proper disposal practices to minimize environmental impact.

3.7. Statutory GHG Reporting and Reduction Requirements

The following federal legislative requirements have been considered in preparation of this GHGMP, and are implemented by KCGM:

- National Greenhouse and Energy Reporting Act 2007 (NGER Act)
- National Greenhouse and Energy Reporting Regulations 2008
- National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 (Safeguard Mechanism Rule).

Clean Energy Regulator – NGER Reporting and the Safeguard Mechanism

The National Greenhouse and Energy Reporting (NGER) scheme, established by the (NGER Act), is a single national framework for reporting and disseminating company information about GHG emissions, energy production, energy consumption and other information specified under NGER legislation.

The Safeguard Mechanism Rule commenced on 1 July 2016, imposing maximum emission limits for facilities with more than 100,000 t CO₂-e Scope 1 emissions per annum (emissions baseline), this applies to KCGM Fimiston Operation with a baseline being set at 238,934 t CO₂-e in 2016.

Since 2009, KCGM has been required to identify and report on Scope 1 and 2 emissions annually for the NGER Fimiston Operations under the NGER Act 2007. This annual reporting cycle has resulted in a detailed understanding of the sources and quantities of both Scope 1 and Scope 2 emissions associated with the KCGM Fimiston Operations.

A reform to the Safeguard Mechanism passed parliament on 30 March 2023 to help Australia reach its net zero target by 2050 and align with recent commitments to a 43% reduction below 2005 emission levels by 2030. The reform achieves this by removing “headroom” from the current baselines and then to tighten these baselines by 4.9% per year until 2030 with further reductions until 2050 (Table 13). While this 4.9% reduction is mandated under Safeguard significant changes in operations would be required including reductions in mining and processing. With the new focus on emissions intensity per ROM tonnes milled it may be achievable. The focus for this proposal is the reduction in Scope 2 emissions where Northern Star has more abatement pathways to implement, while future (post 2030) will rely on future technology development to deliver Scope 1 reductions (Figure 8). The Safeguard mechanism permits the inclusion of Scope 2 abatement in Scope 1 reductions (to reduce ACCUs) when the Scope 2 renewable energy is used to power electric haul trucks replacing fuel usage. This is reflected in Table 13 and Figure 8.

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Table 13 Safeguard reduction of Scope 1 Trajectory

Year	Safeguard Emission intensity forecast	Actual forecast reduction	% requirement for ACCU
FY2024	136,847	207,619	34
FY2025	177,460	218,435	19
FY2026	192,909	230,867	16
FY2027	270,878	248,251	0
FY2028	216,235	221,798	3
FY2029	207,767	243,309	15
FY2030	183,147	177,037	0
FY2031	187,147	118,848	0
FY2032	183,147	53,949	0
FY2033	183,147	50,967	0
FY2034	183,147	56,179	0

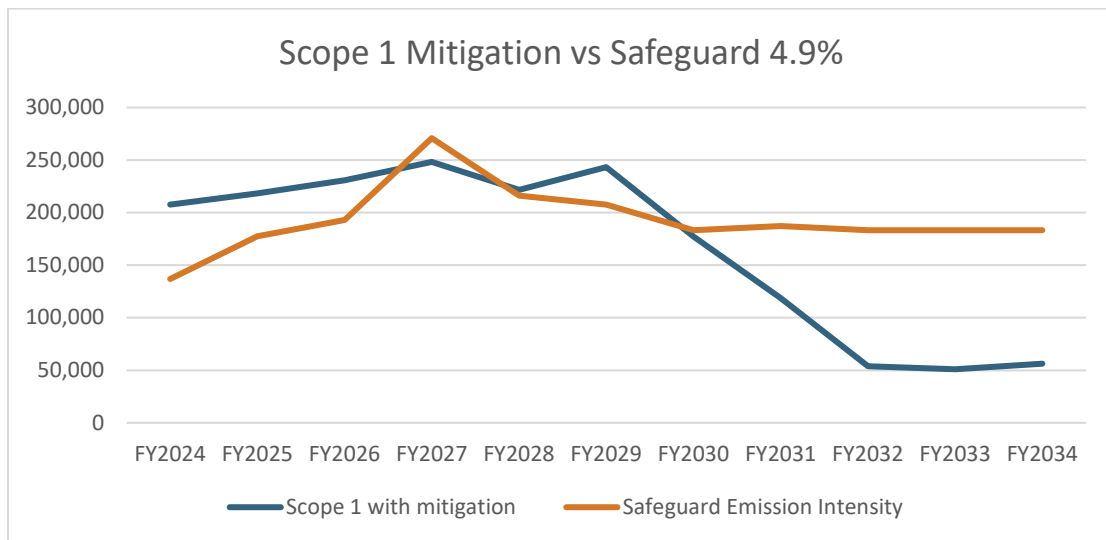


Figure 8 Scope 1 Mitigation and Safeguard Trajectory

3.8. Future Statutory Measures

Australian Sustainability Reporting Standard (ASRS)

The Australian Government have released an Exposure Draft 1 for sustainability reporting where Northern Star are likely to fall into the first group requiring reporting in FY2024.

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As part of the disclosure standard, the scenario planning requires alignment to 1.5 degree scenario.

3.9. Consistency with other (non-statutory) GHG reduction instruments

KCGM submitted a Transitional Calculated Baseline Application for the Fimiston facility after October 2021 (this submission included the proposed FS Project).

The application utilises a prescribed Schedule 2 production variable (ROM Metal Ore) and a site-specific emissions intensity of 0.018141962 t CO₂-e /tonne ROM metal ore that is based on forecast production and emissions data in FY22/23.

The Transitional Calculated Baseline Application has been implemented since FY2021 and will extend to FY2023 GHG emission report submission.

As mentioned above, KCGM's forecast emissions are calculated by applying appropriate emissions intensity factors (consistent with NGER reporting requirements) to KCGM's estimated energy demand forecast for both fuels (Scope 1 emissions) and electricity supply from each source (renewables, grid and the local thermal Power Station).

Renewables are a zero emissions source. KCGM has used a forecast of the SWIS emissions intensity factor as published by Department of Climate Change, Energy, the Environment and Water. The emissions intensity factor for the local Power Station assumes an emissions factor of 0.58 t CO₂-e/MWh, with an assumed heat rate for the station of 11.2 GJ/MWh.

Taskforce on Climate Related Financial Disclosures

Northern Star is committed to understanding how both the physical impacts of climate change and the transition to low carbon operations might affect our business. We have provided details in our Sustainability Reports on our identified climate-related risks and opportunities and detailed our scenario analysis work and our approach to operational resilience in light of potential climate change impacts.

We understand the importance of continuing our alignment with the Taskforce on Climate-Related Financial Disclosures (TCFD) recommendations, and the need for Northern Star to progress its commitment to a low-carbon economy in advancing our Emissions Reduction projects.

Paris Agreement

Northern Star remains committed to the Paris Agreement and the journey towards a net-zero carbon future by limiting global warming to well below 2°C, preferably 1.5°C above pre-industrial levels by 2050.

Northern Star acknowledges the invitation made to the private sector by the United Nations at the Framework Convention on Climate Change when adopting the Paris Agreement, to scale up efforts and support actions to reduce emissions and/or to build resilience and decrease vulnerability to the adverse effects of climate change.

3.10. Offsets

Northern Star's intent is to strive towards zero emissions and improve efficiencies wherever practicable, however it is possible that there will remain a requirement to utilise offsets to achieve Net Zero operational emissions by 2050.

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Reductions in emissions for the KCGM Fimiston Operations will be achieved through the implementation of two renewable energy projects where the Scope 2 emissions can be reduced by approximately 260,000 t CO₂-e. The renewable projects include behind the meter purchase of green energy and the implementation of a circa 200 MW wind farm and circa 100 MW solar farm to provide energy to the mine.

Offsets will be considered a last resort in the event Northern Star is not able to meet the targets outlined in this GHG EMP. Should offsets be required, Northern Star's preferred approach will be to generate the offsets such as carbon sequestration projects from within local communities and with stakeholder involvement, to benefit our stakeholders. Where offsets are required, NSR proposes to use ACCUs to meet the required reductions. As part of this strategy it will seek to obtain "high quality nature based" ACCUs, which may include (but not limited to) environmental planting, savanna fire management and human induced regeneration (including from its own pastoral leases). To this end Northern Star has earmarked three pastoral leases in the Goldfields with potential for such projects.

Studies to confirm the eligibility of these pastoral leases for Human Induced Regeneration (HIR) Carbon Projects have been completed with two of the pastoral leases identified as being immediately suitable for registering as Emissions Reduction Fund projects with the Australian Government.

The third pastoral lease will be eligible for registration pending the proposed amendments to WA's *Land Administration Act 1997*.

Northern Star is progressing the requirements for registering (human induced renewables) HIR projects to meet the Company's future offset needs if required. As part of the Australian Carbon Credit Unit (ACCU) Scheme, crediting is based on carbon captured by changing land management practices to help native forests to regrow on land where human activity has previously prevented regrowth.

Environmental planting or reforestation by environmental or mallee planting (currently new reforestation by environmental or mallee plantings method is under public consultation) method provides the rules for crediting emission reductions to landholders who establish permanent (non-harvest) forest through planting a mixture of native species, or mallee trees. As part of the Australian Carbon Credit Unit (ACCU) Scheme, crediting is based on carbon sequestered in the trees as they grow and the Full Carbon Accounting Model (FullCAM) software will be used to calculate the carbon abatement of the projects.

Savanna fire management provides the rules for crediting emissions reductions from fire management practices in Australia's savanna landscapes as part of the Australian Carbon Credit Unit (ACCU) Scheme. Greenhouse gas emissions in Australia's savanna landscapes are greater from high-intensity fires in the late dry season than those produced from low-intensity fires in the early dry season.

Small, cooler fires during the early dry season, if done strategically:

- reduce the number and size of large, high-intensity late dry season fires
- reduce greenhouse gas emissions

This method recognises the traditional burning methods used by Australia's Indigenous traditional owners for thousands of years.

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3.11. Projects operating beyond 2050

There is currently no intention of FS Project operating beyond 2050. Scope 1, Scope 2 and Scope 3 emissions are predicted to reduce after 2034 as open pit mining operations taper off. Overall reduction in emissions for MS 782 Fimiston are depicted in Figure 9.

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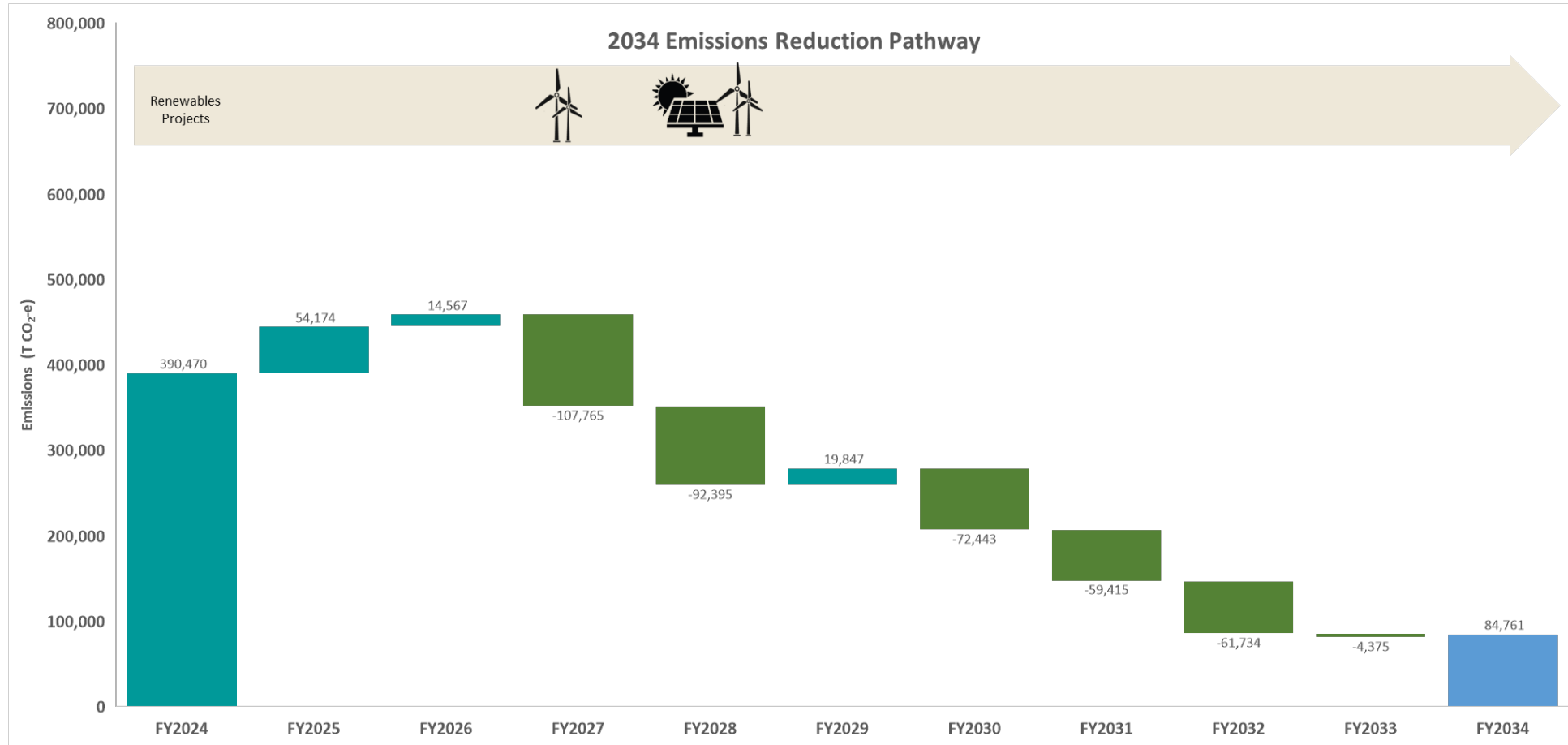


Figure 9 Fimiston Operational Area Emissions Reduction Pathway to 2034

*Teal=production increases, Olive=reduction due to renewables or other measures, Blue=emissions at last year of project

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4. ADAPTIVE MANAGEMENT, CONTINUOUS IMPROVEMENT, AND REVIEW OF THE GHG EMP

KCGM recognises the dynamic nature of current monitoring and reporting requirements and supports adaptive management through adoption of this GHGMP and its implementation. Adaptive management introduces some flexibility to adapt to changes or to implement improved methods of delivery to improve performance and ensure targets for emissions can be met over time. An adaptive management approach will be adopted for the life of the Project. The concept of adaptive management aligns with the systematic approach of a robust environmental management system where the results from actions are monitored, reviewed and the plan is adapted to support continuous improvement.

Adaptive management involves (Table 11):

- Setting clear objectives and targets;
- Monitoring and evaluation against mitigation controls (including triggers and thresholds);
- Implementing mitigation measures or revising measures;
- Regular auditing and review of results;
- Review of emerging technologies and innovations in the mining and processing sector; and
- Systematically adapting to meet environmental objectives.

This may include significant changes to the FS Project design or delivery schedule, as a trigger to review and assess any impacts proposed within this management plan. Assumptions and uncertainties contained within this GHGMP will then be re-evaluated against collected data on a recurrent basis with a focus on continual improvement and the establishment of early response triggers and thresholds.

Any review or additions made to this GHGMP may trigger a requirement for the GHGMP to be re-submitted to EPA for formal review and comment, or if following a written request is received.

Examples of adaptive management throughout operations include:

- The introduction of different / alternative monitoring initiatives to better understand emission emanating from the implementation of works;
- The outcome of additional studies which significantly change the understanding of FS Project emissions, if undertaken; and
- The identification or modification of amended trigger or threshold criteria if more comprehensive policy and/or guidance documentation is publicly released.

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Table 14 Trigger and Response actions

EPA Factor: Greenhouse Gas Emissions EPA Objective: To reduce net greenhouse gas emissions to minimise the risk of environmental harm associated with climate change. Outcome: The operation of the proposal shall (i) comply with the requirement to report Scope 1 emissions under the NGER Act; and (ii) to operate below the emissions intensity set by the Commonwealth under the NGER (Safeguard Mechanism) Rule for the facility. Key environmental values: Climate change Key impacts and risks: Compliance with Regulations. Cost of having to "make-good" on excess emissions				
PERFORMANCE INDICATORS	RESPONSE ACTIONS	MONITORING	TIMING/FREQUENCY	REPORTING
Trigger criteria 1: Average diesel usage over a 3-month period (quarter) is more than 5% above the estimated usage based on the business plan.	Investigate cause for variance.	Diesel usage will be monitored using the monthly diesel delivery invoices.	Diesel usage will be monitored quarterly.	The Annual Compliance Report will provide information on diesel usage and any significant variations to the business plan.
Trigger criteria 2: Estimation of Scope 1 emissions for the facility are higher than the Baseline set under the Safeguard Mechanism Rule based on the business plan.	Investigate cause for variance. Identify and implement opportunities to reduce greenhouse gas emissions to mitigate an exceedance.	Scope 1 emissions will be estimated based on forecast diesel usage from the open pit mine plan.	Scope 1 emissions will be monitored quarterly. Note that diesel usage for open pit mining accounts for approximately 94% of scope 1 emissions at the Fimiston facility.	In the event of an exceedance of the trigger criteria, the exceedance will be reported in the annual Compliance Assessment Report.
Threshold criteria 1: The Scope 1 emissions reported for the Fimiston facility are higher than the Baseline set under the Safeguard Mechanism Rule.	Investigate cause for exceedance. Identify and implement opportunities to reduce greenhouse gas emissions "Make good" on the excess emissions by procuring a quantity ACCUs equal to the excess emissions.	Scope 1 emissions will be calculated in accordance with the NGER Determination (refer to Appendix 1 for details).	Scope 1 emissions are calculated annually.	Scope 1 emissions are reported annually (by 31 October) to the CER under section 19 of the NGER Act.

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5. REPORTING

Northern Star is committed to transparency and a range of public reporting associated with its GHG performance, specifically:

- The site Annual Compliance Report will provide information on diesel usage and any significant variations to the business plan.
- Scope 1 emissions reported annually (by 31 October) to the Clean Energy Regulator (CER) under Section 19 of the NGER Act 1997.
- Scope 2 emissions reported annually (by 31 October) to the CER under Section 19 of the NGER Act 1997.
- As a growth area within the industry, once Scope 3 management is better defined, it is envisaged that these emissions may be included into the Annual Compliance Report as per Scope 1 & 2 emissions.

The Greenhouse Gas Management Plan will be made available on Northern Star’s website.

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6. STAKEHOLDER CONSULTATION

The relevant stakeholders for this GHGMP are:

- Clean Energy Regulator (CER): Reporting under Section 19 of the NGER Act, and for the Safeguard Mechanism Rule;
- Department of Industry, Science, Energy and Resources (DISER): Development of prescribed production variables and associated default emissions intensity values within Schedule 2 of the Safeguard Mechanism Rule;
- Environmental Protection Authority (EPA): Assessment of the revised proposal under Part IV of the *Environmental Protection Act 1986* (EP Act) and development of this GHGMP. All comments received during the assessment period from the EPA, other decision-making authorities and the public that relate to this GHGMP will be considered and where required, changes actioned; and
- Community: When approved, the revised plan will be made publicly available.

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7. CHANGES TO THE GHG EMP

Section 7			
Complexity of changes	Minor Revisions <input type="checkbox"/>	Moderate revisions <input checked="" type="checkbox"/>	Major revisions <input type="checkbox"/>
Date revision submitted to EPA: 31/07/2024			
Is the change proposed to be implemented under condition C3-3? If so, the proponent must provide a copy to the CEO at least 20 days before commencing implementation			Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Proponent's operational requirement timeframe for approval of revision	<One Month <input checked="" type="checkbox"/> <Six Months <input type="checkbox"/> >Six Months <input type="checkbox"/> None <input type="checkbox"/>		
Reason for Timeframe			

Item no.	Section no.	Page no.	Summary of change (separate track changes document to be provided)	Reason for change	New or increased adverse impacts to the environment? Risk to the achievement of limits, outcomes or objectives?
1.	Whole document	Whole document	New Document. Greenhouse Gas Management Plan (GHGMP) developed to meet the requirements of the EPA.	This GHGMP was specifically developed to support assessment of the Fimiston South Project by the EPA under Part IV of the EP Act.	Yes, proposal to extend mine life
2.	N/A	N/A	Sub development of project specific GHGMP to ensure continuation of GHG reporting under NGER Act 1997.	Segregation of additional works, outside of normal site activities captured within parent document.	N/A
3.	Whole document	Whole document	Document updated to align further with the 2023 EPA Guidelines. Estimated emissions presented as tonnes per annum (tpa) of carbon dioxide equivalent (CO ₂ -e) throughout the document. Justification of the emissions baseline proposed and alternative approaches that were considered have been provided. Trajectory of emission reductions and mitigation measures should be aligned with sections 3.2 and 3.3 of the GHG EMP template. Benchmarking assessment and comparisons against other projects	Updated guidelines from the EPA issued April 2023.	No.

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Item no.	Section no.	Page no.	Summary of change (separate track changes document to be provided)	Reason for change	New or increased adverse impacts to the environment? Risk to the achievement of limits, outcomes or objectives?
			added to allow for a comparison of forecasted emissions. Baseline and trajectory presented in graph(s) and table format as tonnes of CO ₂ -e and with time periods aligning.		
			Version 13 as of July 2024		
4	Whole document	Whole document		Document updated in response to submissions received from regulators and the public 18 June 2024.	No
			Version 14 October 2024		
5	Whole document	Whole document	Included Scope 1 mitigation measures and revised table and figures to separate and more clearly set out KCGM's Greenhouse Gas forecast. Clarified Baseline figures. Reviewed the emission intensity data and updated figures. Provided safeguard tables and figures. Provided more detail of contingency offsets.	Document updated to align with updated response to submissions document comments from DWER Sept 2024.	No impacts have been reduced.
			Version 14 November 2024		
6	Whole Document	Whole Document	Clarified mine optimisation comments Corrected emissions intensity calculations Reference to Mine Closure Plan Provided specific evidence for technology development Added information on efficiency training Strengthened commitment to safeguard targets		

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8. GLOSSARY

CER	Clean Energy Regulator
CH ₄	Methane
CO ₂ -e	Carbon dioxide equivalent
EMP	Environmental Management Plan
EPA	Environmental Protection Authority (Western Australian)
EP Act	<i>Environmental Protection Act 1986</i> (Western Australian)
FullCAM	Full Carbon Accounting Model
FS	Fimiston South
FS Project	Fimiston South Project
GHG	Greenhouse Gas
GHGMP	Greenhouse Gas Management Plan (this document)
HIR	Human Induced Regeneration
KCGM	Kalgoorlie Consolidated Gold Mines Pty Ltd
kL	Kilolitre (1,000 litres)
km	Kilometre
kV	Kilovolts
LOM	Life of Mine
LPG	Liquefied petroleum gas
MP	Management Plan
MS	Ministerial Statement
Mtpa	Million tonnes per annum
NGER Act	<i>National Greenhouse and Energy Reporting Act 2008</i>
NGER Determination	National Greenhouse and Energy (Measurement) Determination 2009
N ₂ O	Nitrous Oxide
PPA	Power Purchase Agreements
ROM	Run-of-Mine
SF ₆	Sulphur Hexafluoride
Safeguard Mechanism Rule	<i>National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015</i>
SWIS	South West Interconnected System
TCFD	Taskforce on Climate-Related Financial Disclosures
TSF	Tailings Storage Facility
t CO ₂ -e	Tonnes of carbon dioxide equivalent
WEM	Wholesale Electricity Market
WRD	Waste Rock Dump

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10. APPENDICES

10.1. Appendix 1: Measurement Criteria of GHG Emissions

Monitoring and management of GHG emissions is primarily based on invoiced quantities of fuels, electricity, and materials, and is consistent with the NGER Determination.

Emissions quantities are calculated by applying the relevant conversion method from the NGER Determination. KCGM uses the default method (Method 1) in all cases.

The table below outlines the techniques used for emissions measurement at KCGM, and the relevant measurement criteria and methodology in the NGER Determination.

EMISSIONS SOURCE	MEASUREMENT CRITERIA	EMISSIONS METHODOLOGY	MEASUREMENT CRITERIA
Diesel	Invoices	Method 1	A ³
LPG	Invoices	Method 1	A
Gasoline	Invoices	Method 1	A
Oils and greases	Invoices	Method 1	A
Electricity	Invoices	NA	NA

Scope 3 emissions for fuel and energy related activities were calculated using actual and forecasted fuel usage and electricity consumption data. Actual data was sourced from the Fimiston NGER FY22 report. Emissions for purchased goods and services, and upstream transport and distribution were calculated using actual supplier spend data from FY22. Relevant Scope 3 emission factors were used to convert total spend to Scope 3 GHG emissions. Emission factors were sourced from *US EPA Supply Chain Emission Factors guidance documents*.

10.2. Scope 1 Emissions Calculations

Scope 1 emissions calculations were based on the NGER emissions factor of 0.002709720. This factor is multiplied by the calculated estimate of litres of diesel expected to be used in each financial year. For the years 2024, Scope 1 emissions were derived from a detailed short-term financial forecast developed by KCGM for the purposes of costing the pit expansion. This included a forecast of diesel use costs, which were converted to a kL quantity using the business price forecast, and to emissions using the factors in the Australian Government National Greenhouse Accounts ('NGA factors'). Forecasts for 2024 and beyond have been calculated on mine plan modelling of expected diesel usage.

An uplift factor of 3.1% was applied to account for emissions from LPG and minor emissions sources such as oils and greases, gasoline and sulphur hexafluoride. LPG consumption correlated with gold production (Figure 2). This is expected because LPG is primarily used in gold recovery.

For the period between 2024 and 2038, diesel consumption was derived from the Life-of-Mine (LOM) forecast, which is used for long term mine planning. This forecast includes expected annual quantities of ore mined, ore processed, and gold produced. Historical data indicated a reasonable correlation

³ Minor quantities of diesel are measured according to criteria BBB

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between diesel consumption and total ore mined. This is expected because all the material that is mined, including waste rock; is recovered using diesel-powered excavators, haul trucks and other diesel-powered equipment.

10.3. Scope 2 Emissions Calculations

Electricity is mainly consumed in the crushing and grinding operations in the mill. Between 5% and 10% of the total mined quantity of ore is sent for processing. The balance is waste rock which is stockpiled.

KCGM sources a minor quantity of electricity from the SWIS, with most electricity being obtained from local generation plants in Kalgoorlie. This source is classified as “off grid” supply in NGERs because it is not connected to the SWIS.

There is a good correlation between electricity consumption and ore processed and Scope 2 emissions were calculated based on total tonnes milled using a conversion factor of tonnes to KWh starting at 0.46 and a conversion factor of KWh to CO₂-e of 0.00046000 and reducing over time as set out in the table below.

Year	Conversion factor t CO ₂ -e / MWh	Conversion factor t CO ₂ -e / kWh
2024	0.46	0.00046
2025	0.41	0.00041
2026	0.38	0.00038
2027	0.35	0.00035
2028	0.31	0.00031
2029	0.29	0.00029
2030	0.24	0.20004
2031	0.23	0.00023
2032	0.22	0.00022
2033	0.21	0.00021
2034	0.20	0.00020

For the Local Thermal Power Station Scope 2 emissions a factor was calculate based on numbers provided in the TransAlta NGER report for the 2023 financial year period. This number was calculated in accordance with the NGER determination, using all applicable methods relevant to Electricity Generations. The calculated factor is 0.587 kg CO₂-e/kWh.

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