Plan

Greenhouse Gas Management Plan

PEG Power Station

July 2020

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Greenhouse Gas Management Plan			
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1. INTRODUCTION

1.1 Description of Project

Pilbara Energy Generation Pty Ltd (PEG), a wholly owned subsidiary of Fortescue Metals Group (Fortescue) is developing the Pilbara Energy Generation Program (PEG Program). The Program involves the development of 275km of high voltage transmission lines connecting Fortescue's mine sites, together with 150 MW of solar photovoltaic (PV) electricity generation and the proposed 165 MW PEG Power Station.

The PEG Power Station is the subject of this Greenhouse Gas Management Plan.

The PEG Power Station will provide lower emission and highly reliable energy to the North Star Magnetite Project (now known as Iron Bridge Magnetite Project) than was previously approved by the Western Australian Government under Ministerial Statement 993 (North Star Magnetite Project).

The PEG Power Station is located adjacent to the existing Solomon Power Station at the Solomon Iron Ore Mine and will involve the construction of 14 new gas-fired reciprocating engines with a combined maximum installed capacity of 165 MW. It is expected that the average export from the facility will be approximately 150 MW per annum. The PEG Power Station will replace the need to construct the approved power station at the Iron Bridge Magnetite Project.

The PEG Power Station is expected to produce a maximum of 1,445,400 MWh of electricity per annum, with maximum Scope 1 greenhouse gas emissions estimated at 670,666 tCO2-e per annum. Natural gas for the PEG Power Station will be delivered via the existing Fortescue River Gas Pipeline.

While the PEG Power Station has been referred to the EPA as a standalone project, it also forms part of Fortescue's broader ambition to reduce greenhouse gas emissions across the organisation in line with Fortescue's emissions reduction target (see Section 2.5.2 of this Plan), and as such the contribution that the project has to reducing total Fortescue emissions has also been considered.

The PEG Power Station replaces the 221MW North Star Power Station previously approved under *MS 993 – North Star Magnetite Project*. Due to a smaller capacity, more modern and more efficient gas-fired power station being constructed in PEG (compared to the power station that was planned and approved at North Star) a significant greenhouse gas emission reduction will be realised. An application under Section 45C of the *Environmental Protection Act* (1986) was submitted simultaneously (with the PEG Power Station referral document) to remove the construction of the 221MW power station from the North Star Magnetite Project.

1.2 Requirement for Management Plan

This Greenhouse Gas Environmental Management Plan (the Plan) was prepared for submission with the referral of the PEG Power Station to the Western Australian Environmental Protection Authority (EPA).

In accordance with EPA guidance titled *Content of a Greenhouse Gas Management Plan* (in draft status at the time of preparation of this Plan), the following Table outlines the content of this Plan in relation to required subject matter.

Table 1: Content of the Greenhouse Gas Management Plan

Required Content	Location in this Plan
Proposal description	Section 1.1
Condition requirements	Not required – conditions not yet applicable to this Management Plan at time of writing.
Rationale and approach	Section 1.6
Provisions	
• Objective (including targets)	Sections 1.3 and 2.5.2
• Estimated emissions	Section 2.1
• Emission reductions	Section 2.3
• Mitigation measures	Section 2.3
• Additional abatement	Section 2.5.2
• Public reporting	Section 2.4

1.3 Objective and Scope

This Plan addresses the EPA's requirements described in the *Environmental Factor Guideline: Greenhouse Gas Emissions* (April 2020), that a proponent demonstrates their contribution towards the aspiration of net zero emissions by 2050, in relation to the Scope 1 GHG emissions of the PEG Power Station.

The objective of this Plan is to illustrate:

- The intended reduction in Scope 1 emissions of the PEG Power Station,
- The greenhouse gas emissions reduction target that reflects an incremental reduction in Scope 1 emissions of the PEG Power Station,
- That all reasonable and practicable measures have been applied to avoid, reduce and offset the PEG Power Station's Scope 1 GHG emissions.

1.4 Legislation and Regulatory Framework

Fortescue employees and contractors are obliged to comply with all relevant State and Commonwealth legislation. Legislation directly relevant to the management of GHG emissions in Western Australia is provided in the following table.

Table 2: Applicable legislation and regulatory framework for GHG emissions management

Legislation	Application
Environmental Protection Act 1986 (WA)	State environmental impact assessment and Ministerial approval process.
National Greenhouse and Energy Reporting Act 2007 (Cwlth)	National framework for reporting greenhouse gas emissions, greenhouse gas projects and energy consumption and production by Corporations in Australia.
National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 (Cwlth)	Compliance rules and procedures for administering the safeguard mechanism, which applied to facilities with Scope 1 covered emissions of more than 100,000 tCO2-e per year.
National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Cwlth)	Describes the methods, standards and criteria to be applied when estimating greenhouse gas emissions, energy production and consumption.
Environmental Factor Guideline (Greenhouse Gas Emissions) (Environmental Protection Authority, 2020)	Describes how the environmental factor (Greenhouse Gas Emissions) is considered by the EPA in the environmental impact assessment process.
Greenhouse Gas Emissions Policy for Major Projects	Policy used to guide Western Australian Government decision making for major projects that are assessed by the Environmental Protection Authority.

Legislation	Application
(Government of Western Australia, 2019)	

1.5 Key Assumptions and Uncertainties

Table 3: Key assumptions of the Plan

Assumption	Justification / Explanation
The Plan (including GHG emission calculations) is based on the proposed maximum capacity of the power station – 165 MW.	This Plan is based on the maximum capacity of the PEG Power Station. However, the PEG Power Station is not expected to permanently produce 165 MW of electricity.
Greenhouse gas emission estimates are derived from published energy content and emission factors.	GHG emissions have been estimated from energy content and emission factors contained in *National Greenhouse and Energy Reporting (Measurement) Determination 2008* (2019 version).
The Default Emission Intensity from the Safeguard Mechanism Rule presented in Table 5 is applicable to the PEG Power Station.	Fortescue considers that the Default Emissions Intensity presented in Schedule 2, Part 57 of the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* apply to the PEG Power Station

Table 4: Uncertainties associated with the Plan

Uncertainty	Justification / Explanation
Fortescue's product and mine strategy may be amended in the future, resulting in a change to the PEG Power Station GHG emissions.	Fortescue's product and mine strategy is market driven and may result in changes, potentially resulting in higher or lower GHG emissions from the PEG Power Station.
Alternative and/or innovative sources of energy may become available in the future that can avoid or minimise GHG emissions from the PEG Power Station.	Fortescue will investigate relevant alternative and/or innovative energy sources (eg, renewables, hydrogen, etc) when they become viable in the future.

1.6 Rationale of Approach

Benchmarking

In Western Australia, the PEG Power Station will be relatively unique. All other Western Australian gas fired reciprocal power stations, are at least 80MW smaller in capacity, with most below 20MW.

The 18MW Mungullah Power Station in Carnarvon, was commissioned in 2014 and is operated by the State Government owned Horizon Power. This power station is similarly situated in the North West of Australia, and is a reciprocal gas fired facility. The PEG Power Station has superior performance compared to this facility in terms of GHG emissions intensity (see Table 5). The PEG Power Station also compares favourably to the State Government owned Synergy wind diesel (reciprocal) installations at Coral Bay and Hopetoun where 40% of the towns' power is generated by wind turbines (Synergy, 2020).

South Hedland Power Station is the lowest emission intensity gas fired power station of similar capacity (150MW) to the PEG Power Station on the North West Interconnected System (NWIS). This power station was commissioned in 2017, is operated by TransAlta and pairs a gas turbine with combined cycle technology (CER, 2019). The PEG Power Station's emission intensity is superior to this power station. According to CER (2019) all other gas fired power stations connected to the NWIS reach higher emission intensities (as sourced from 2018-19 reported data); Paraburdoo Power Station (0.52 tCO2-e/MWh), West Angelas Power Station (0.53 tCO2-e/MWh), Yurralyi Maya Power Station (0.55 tCO2-e/MWh), Port Hedland Power Station (0.75 tCO2-e/MWh), Cape Lambert Power Station (0.56 tCO2-e/MWh) and Karratha Power Station (0.81 tCO2-e/MWh).

AGL's Barker Inlet Power Station has similar specifications to the PEG power station, this facility is located on Torrens Island which adjoins Port Adelaide and is approximately 15 km northwest from Adelaide, South Australia (Coffey, 2017). The first stage of Barker Inlet Power Station was commissioned in 2019, comprising 210MW of reciprocal gas fired generation, with the ability to be fired on diesel fuel "as market conditions require or if emergency conditions arise". Using information presented in the Environmental and Social Assessment Report (Coffey, 2017) it was possible to calculate emissions for Scenario 1 (Forecasted operations, Stage 1 +TIPS B – Typical Operations) and Scenario 2 (BIPS maximum share Stage 1 + TIPS B - BIPS operations prioritised). Scenario 1 achieved a carbon intensity of 0.589 tCO2-e/MWh, and Scenario 2 achieved a carbon intensity of 0.560 tCO2-e/MWh. PEG achieves a carbon intensity of 0.464 tCO2-e/MWh, however, it is noted that the Torrens Island Power Station is included in these scenarios, and with the information available to date, the Barker Inlet Power Station cannot be isolated.

Highly efficient gas-fired reciprocating engines will be used at the PEG Power Station, capable of producing a significantly lower emissions intensity than the Default Emission Intensity for

Electricity Generation defined in Schedule 2 of the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015.*

Table 5 below compares the PEG Power Station with the benchmark identified in the Safeguard Mechanism Rule, Fortescue's existing gas-fired Solomon Power Station as well as other comparable power stations in regional Western Australia. The comparison illustrates the highly efficient infrastructure proposed to be installed.

Table 5: Emission intensity benchmarks

165MW Nominal PEG Power Station Emission Intensity* tCO2-e/MWh	Default Emission Intensity (*Schedule 2, Safeguard Mechanism Rule*) tCO2-e/MWh	122MW Existing Solomon Power Station 2018-19 intensity tCO2-e/MWh	18MW Mungullah Power Station 18-19 intensity** tCO2-e/MWh	2.92MW Coral Bay Wind-Diesel System 18-19 intensity ** tCO2-e/MWh	3.76MW Hopetoun Wind-Diesel System 18-19 intensity ** tCO2-e/MWh	210MW Barker Inlet Power Station Scenario 2 tCO2-e/MWh***	210MW Barker Inlet Power Station Scenario 1 tCO2-e/MWh***	150MW South Hedland Power Station 18-19 intensity ** tCO2-e/MWh
0.464	0.538	0.628	0.61	0.50	0.45	0.56	0.589	0.49

* Based on heat rate of 9 GJ/MWh and pipeline natural gas emission factor of 51.53 kgCO2-e/GJ (*National Greenhouse Accounts Factors*, August 2019).

** Sourced from Clean Energy Regulator Electricity sector emissions and generation data (CER, 2019 accessed July 2020)

*** Sourced from Barker Inlet Power Station, Environmental and Social Assessment Report Section 49 Development Application supporting report, prepared for AGL.

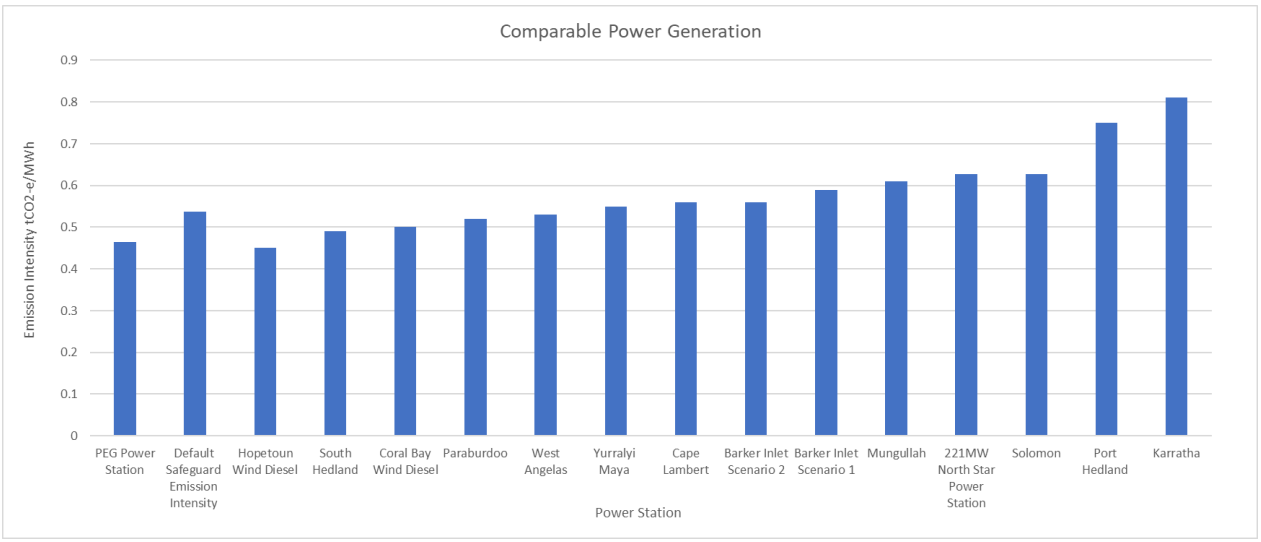


Figure 1. Emission Intensity Comparison based on 2018-19 reported figures

The PEG Power Station intensity displayed in Table 5 and Figure 1 above, does not include the solar PV installations that will be constructed to support the wider PEG program, which if included would lower the intensity further. All power stations included in Table 5 and Figure 1, apart from Hopetoun and Coral Bay Wind Diesel, are exclusively or near exclusively fired on natural gas (generally diesel fuel will only be used for exceptional circumstances such as emergencies).

Design

The PEG Power Station has been designed with industry leading and highly efficient gas-fired reciprocating engines to provide energy to a number of Fortescue mines across the Pilbara that could otherwise rely on diesel to produce electricity.

Anticipated as part of the greater PEG Program is the installation of 150 MW of solar PV electrical generation capacity. In addition to this a 60MW battery system is planned, which will be used in lieu of a gas turbine to provide spinning reserve on the grid to counter issues relating to faults or other loss in electrical supply on the network.

A new Power Management System will be installed to integrate the PEG Power Station, existing Solomon Power Station and additional anticipated renewable sources (eg, solar, wind) and battery storage, to ensure the most efficient use and dispatch of electricity across the system.

2. ENVIRONMENTAL MANAGEMENT

2.1 Estimation of Greenhouse Gas Emissions

Greenhouse gas emissions from the PEG Power Station come from the combustion of pipeline natural gas (the only source of Scope 1 greenhouse gas emissions from the project) to produce approximately 1,445,400 MWh of electricity per year from up to 14 gas-fired reciprocating engines, calculated as:

165 MW x 24 hours x 365 days

The estimated annual greenhouse gas emissions from the PEG Power Station are calculated below in Table 6, based upon the following factors:

- Power station heat rate = 9 GJ/MWh. The heat rate is an indication of the efficiency of the power station to convert heat energy stored in fuel, into electricity.
- Natural gas emission factor (Scope 1) = 51.53 kgCO2-e/GJ (*National Greenhouse Accounts Factors*, July 2017, Department of the Environment and Energy; Table 2). The gas emissions factor is a standard estimate of the amount of carbon dioxide equivalent emissions created for each gigajoule of energy produced.
- Natural gas emission factor (Scope 3) = 3.9 kgCO2-e/GJ (*National Greenhouse Accounts Factors*, July 2017, Department of the Environment and Energy; Table 38).
- Life of project = 40 years.

The table below calculates the estimated emissions on both an annual basis (670,666 tCO2-e), as well as unabated cumulative emissions volume over the proposed 40 year life of the project.

Fortescue's industry leading emissions reduction commitments, including the net-zero position by 2040, is highlighted by the significant reduction of 17milliion tonnes of CO2-e emission over the project life.

Table 6: Estimated GHG emissions (Scope 1, Scope 2 & Scope 3) from the PEG Power Station

Source of GHG Emission	Scope 1 (tCO2-e)	Scope 2 (tCO2-e)	Scope 3 (tCO2-e)	Total Emissions (tCO2-e)
Combustion of pipeline natural gas – annual emissions	670,666	0	50,734	721,399
Combustion of pipeline natural gas – life of project emissions	26,826,624	0	2,029,342	28,855,966
Target Life of Project Emissions	9,617,240	0	2,029,342	11,646,582

2.2 Safeguard Mechanism Greenhouse Gas Emissions Benchmarking

The PEG Power Station will trigger the requirements of the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* (Safeguard Mechanism) during the first year of operation. The Safeguard Mechanism is triggered when a responsible emitter produces greater than 100,000 tCO2-e during a financial year.

With forecast GHG emissions greater than 100,000 tCO2-e during a financial year, Fortescue will apply for a Benchmark-Emissions Baseline under the Safeguard Mechanism based on the following production variable, defined in Schedule 2 of the Safeguard Mechanism:

- Electricity generation

The Benchmark-Emissions Baseline will be supported by a Default Emissions Intensity for electricity generation (currently set at 0.538 tCO2-e/MWh). GHG emissions from the PEG Power Station will be benchmarked against the Default Emissions Intensity, and under the Safeguard Mechanism, Fortescue will be required to offset any emissions in excess of the Benchmark-Emissions Baseline.

2.3 Design of Project to Minimise Greenhouse Gas Emissions

The following elements of the PEG Power Station have been designed or considered to eliminate or minimise GHG emissions.

2.3.1 Replacement of High-Emission Power Station

The construction of the PEG Power Station will see a net reduction in Fortescue's Scope 1 greenhouse gas emission through the replacement of the approved 221MW North Star Power Station (approved under Ministerial Statement 993). The anticipated greenhouse gas emissions from the North Star Power Station are estimated to have been 1,196,426 tCO2-e per annum.

Greenhouse gas emissions from the PEG Power Station are anticipated to be 670,666 tCO2-e per annum, representing a reduction of 525,760 tCO2-e per annum (44% reduction) from the alternative and a 21,030,400 tCO2-e avoidance over the proposed 40-year life of the project.

2.3.2 Location

The PEG Power Station is located adjacent to the existing Solomon Power Station and the Fortescue River Gas Pipeline.

The area of land adjacent to the existing Solomon Power Station is already cleared, which avoids the necessity to clear additional vegetation, and the inherent GHG emissions from the activity.

The Fortescue River Gas Pipeline already supplies natural gas to the existing Solomon Power Station and locating the PEG Power Station adjacent to the existing power station avoids the requirement to build additional pipelines, and the inherent GHG emissions from the activity.

2.3.3 Energy Source

Natural gas has a lower emissions intensity than other fossil fuel energy sources (eg, diesel), which minimises the GHG emissions produced by the power station.

Additionally, renewable energy sources can be used to reduce the amount of energy needed to be produced by the PEG Power Station. For example, solar PV energy may displace daytime energy production from the PEG Power Station, as well as production from the existing Solomon Power Station. Wind energy is also being considered for inclusion into the future energy strategy of the PEG Program.

2.3.4 Engine Selection

Highly efficient gas-fired reciprocating engines have been selected for the PEG Power Station to enable a lower volume of gas to be consumed. The heat rate of the PEG Power Station engines (GJ gas consumed per MWh of electricity produced) is approximately 25% better than the gas turbine engines currently utilised at the adjacent Solomon Power Station, and those that were proposed to be used at the North Star Magnetite Project (ie the Power Station that PEG is being constructed in place of).

The engines selected for the PEG Power Station have an efficiency comparable to modern combined cycle power stations, however, will only use a fraction of the water that a gas turbine fitted with a heat recovery steam generator would consume. As displayed above in Table 5 these engines provide class leading performance in terms of greenhouse gas intensity when compared to other reciprocal engine installations in Western Australia.

2.3.5 Technology

To capitalise on the efficiency and stability of the energy produced by PEG, an advanced Power Management System is being considered to integrate the PEG Power Station, existing Solomon Power Station and additional anticipated renewable sources (eg, solar, wind) and battery storage. The integration of current and future energy assets will provide opportunities for GHG emission reductions by seamlessly and efficiently dispatching electricity across the system, based on complex algorithms that monitor and control the entire generation network.

The Solar PV array planned as part of the PEG Program will also install tracking PV which will have an improved capacity factor (increased electrical output) compared to a fixed solar array, further adding to opportunities for reduced GHG emissions.

Additionally, circuit breakers that avoid the use of sulphur hexafluoride (SF6) are anticipated to be used at the PEG Power Station.

2.4 Monitoring and Public Reporting of Greenhouse Gas Emissions

Fortescue is required to comply with the requirements of the *National Greenhouse and Energy Reporting Act 2007*, which requires Fortescue to monitor and report all GHG emissions within the organisation (including from the PEG Power Station) – see Figure 2. In doing so, the information captured enables Fortescue to calculate an emissions intensity, which can be compared to benchmark values.

Greenhouse gas emissions generated by the PEG Power Station will be reported to the Clean Energy Regulator annually by 31 October and will be publicly available from the Clean Energy Regulator website.

Fortescue's greenhouse gas emissions and performance against the greenhouse gas emission reduction target are reported publicly in Fortescue's annual Climate Change Report, which is published on the Fortescue website in August each year.

In addition to the above annual reporting, greenhouse gas emissions and progress against the implementation of this plan will be provided in the annual report relating to the PEG Power Station and be made available to the public as required (e.g. in accordance with the EPA's *Post Assessment Guideline for Making Information Publicly Available (PAG 4)*).

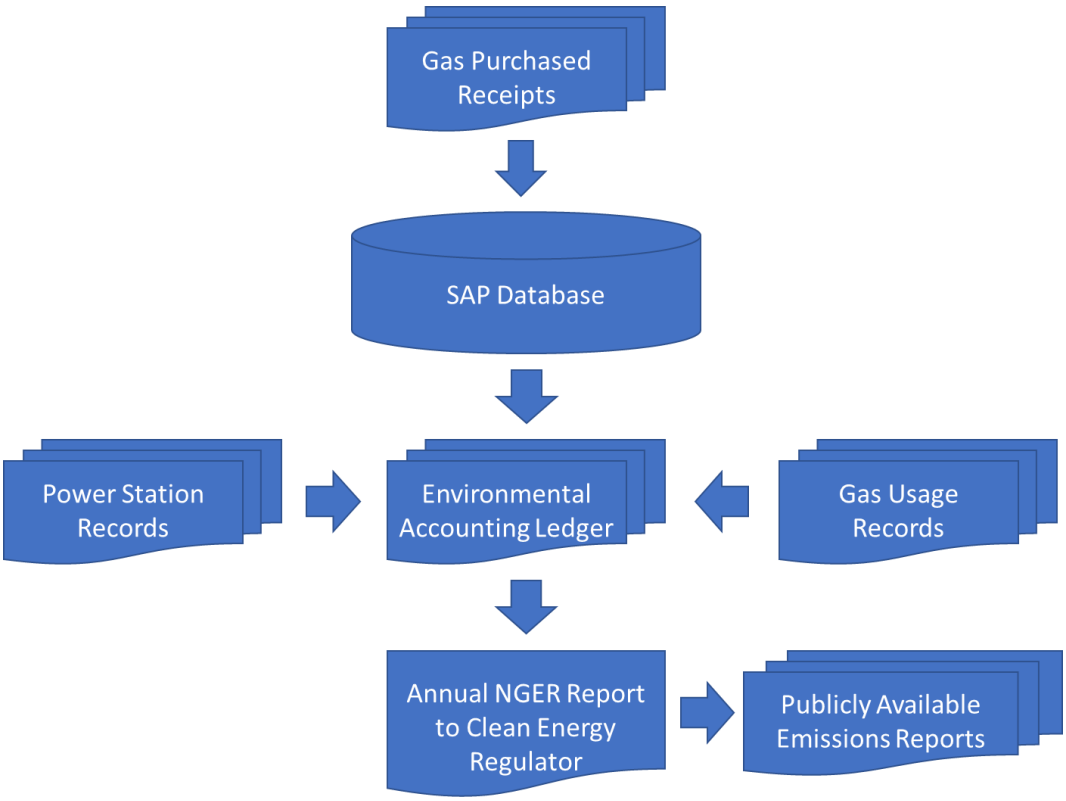


Figure 2. Monitoring and Reporting GHG emissions to the Clean Energy Regulator

2.5 Measures to Avoid, Reduce and Offset Emissions

2.5.1 Alternatives Considered

Other scenarios were considered when options for additional power supply were analysed. This scenario was selected as the best option due to its energy efficiency, use of existing infrastructure, ability to support further use of renewables in Fortescue's operations and cost.

2.5.1.1 Proposed scenario

The location of this option is preferred as there is gas supply, previously cleared land and much of the infrastructure required to support power generation and transmission are already in place.

Considering the lack of disturbance, lower emissions (670,666 tCO2-e per annum) and reduced emission intensity (0.464 tCO2-e/MWh) of the PEG Power Station (even before solar and battery integration) the PEG Power Station compares very favourably with the alternative development option (construction of the approved North Star Magnetite Project power station). The PEG option ensures that development and operation of the North Star Magnetite Project approved under MS 993 (without the development of the 221 MW Power Station), is able to proceed with a reliable and secure energy supply, while also minimising environmental impact as far as practicable.

2.5.1.2 Alternative power station

The alternative power supply scenario is the construction of the power station at the North Star Magnetite Project, approved under MS 993.

The North Star power station would be larger in capacity and would have higher overall emissions (1,196,423 tCO2-e per annum) and emission intensity (0.618 tCO2-e/MWh) of greenhouse gases. Total emissions and emission intensity of other pollutants such as NO_x, SO_x, CO and PM would also be proportionally higher due to the combustion of additional fuel.

The calculations for the alternative scenario were based on the procurement of GE LM6000 gas turbines in combination with Solar Titan Turbines, similar to that at Solomon Power Station. LM6000 gas turbines offer high reliability, fast dispatch, dry low emission technology and best cost per megawatt in their power class while occupying a small footprint (Baker Hughes, 2020) and fit the specifications that were outlined (~40MW gas turbines) in the original North Star PER (Fortescue, 2013), with auxiliary support from Solar Titans when increased from 120MW to 221MW. Two LM6000s and four Solar Titans are installed at Solomon Power Station, and data from these units including heat rates was used in the calculation of emissions. The PEG Power Station will be superior to this approved arrangement in terms of emission intensity and total emissions.

The alternative would also necessitate the construction of an additional gas pipeline to the North Star mine, which would involve fugitive emissions during normal operations as well as additional clearing for both the power station and pipeline.

An application under S45C of the *Environmental Protection Act 1986* has been submitted to remove the approved 221MW power Station from the North Star Magnetite Project.

2.5.1.3 Alternative locations and technologies

Alternative locations were considered for siting the PEG Power Station, including within the area approved for North Star under MS 993, however this would have required clearing, and the construction of a new gas pipeline. The proposed location adjacent to the Solomon Power Station makes use of previously cleared land and existing infrastructure (including the existing Fortescue River Gas Pipeline).

Alternative technologies such as gas turbines were considered for the Proposal. These were less efficient, and more greenhouse gas intensive as is evident from the current emissions intensity rate of the Solomon Power Station (0.618 tCO2-e/MWh). Integration of additional technologies, including energy storage and renewable energy have been considered and will be investigated throughout the life of the Proposal.

2.5.1.4 No development option

In a no-development scenario, there would be no potential environmental impacts. The no development scenario would mean a halt to further development of the North Star Project approved under MS 993, (Iron Bridge Magnetite Project) as it would be unable to proceed without an electrical power supply. This would also mean that the Eliwana Project would be permanently powered by an on-site diesel power station, resulting in higher emissions.

Additionally, there would be a loss of social and economic benefit at a local, regional and state level, such as:

- New infrastructure for the Pilbara, including power transmission.
- A lack of employment and training opportunities for remote and isolated communities.
- The halt of development of the expansion to the existing North Star Project/Iron Bridge Magnetite Project, which will prevent the opportunity for the further optimisation and improved return on investment.

2.5.2 Emission reduction targets and offsets

Fortescue has identified an emissions reduction ambition that exceeds the target identified in the *Greenhouse Gas Emissions Policy for Major Projects*. This target has been announced publicly by the Fortescue Chief Executive Officer and is a central element of Fortescue's future business plan. It is a high-profile commitment that is of great interest to our stakeholders including the communities in which we operate, our shareholders and investors, the general public, and government.

Performance against the target, as well as annual initiatives and forecast reductions, will be reported in the annual Climate Change Report, released on the Fortescue website during August each year.

Exceeding the *Greenhouse Gas Emissions Policy for Major Projects* (WA Government 2019) of net-zero by 2050 and the *Environmental Factor Guideline – Greenhouse Gas Emissions* (EPA 2020), Fortescue has developed the following greenhouse gas emissions target:

> *Achieve net zero operational emissions by 2040. **

* Includes Scope 1 and Scope 2 greenhouse gas emissions associated with Fortescue activities.

The PEG Power Station, PEG Program and transmission network have been designed in a way to facilitate future high levels of renewable penetration. As a result, 150MW of PV solar farms are planned to be integrated into this network. These PV installations may achieve high levels of penetration during daylight hours, ideally displacing fossil fuel generation during these periods. Integration of additional renewable generation, energy storage and the adoption of new technologies (such as the blending of green hydrogen) is likely in coming years, with the goal of facilitating emission intensity and total emission reductions.

In addition to the long term target of net-zero by 2040, Fortescue also commits to a 2% year-on-year reduction until 2030, of net GHG emissions when compared to the baseline 670,666t CO2-e. Fortescue will investigate process changes, efficiency improvements and additions to renewable energy infrastructure to assist in the attainment of these proposed reduction between commencement of operations and 2030. Acceleration to a net-zero position for all of Fortescue's assets, including the PEG Power Station, will occur between 2030 and 2040 as new technology evolves and opportunities such as those identified above are implemented.

Evaluation of Fortescue's progress against the 2% reduction target will be undertaken on a five-yearly basis, where the actual cumulative emissions over the previous 5-year period will be compared against the target cumulative emissions. In the event that the actual cumulative emissions are greater than the cumulative target emissions, Fortescue will offset the difference via the surrender of appropriate GHG related carbon credits.

Table 7: PEG Power Station Reporting Period Progressive Greenhouse Gas Reduction Targets

Reporting Period	Target Net Emissions for Reporting Period
Commencement Date to 30 June 2025	As per Condition 6-1 (1)
1 July 2025 - 30 June 2030	2,912,300 tCO2-e
1 July 2030 - 30 June 2035	2,443,087 tCO2-e
1 July 2035 - 30 June 2040	1,040,001 tCO2-e
1 July 2040 onwards	0 $tCO_{2\text{-}e}$

As previously stated, the PEG Power Station provides a foundation of stable energy that will form a pillar of Fortescue's interconnected energy network. The construction and commissioning of the PEG Power Station will result in low emission intensity energy production to support the North Star Magnetite Project development. The addition of renewable energy such as the planned solar, will further reduce the emissions intensity of energy available for Fortescue's collective consumption.

The PEG Power Station is Fortescue's first significant step in reaching its net-zero emissions target by 2040.

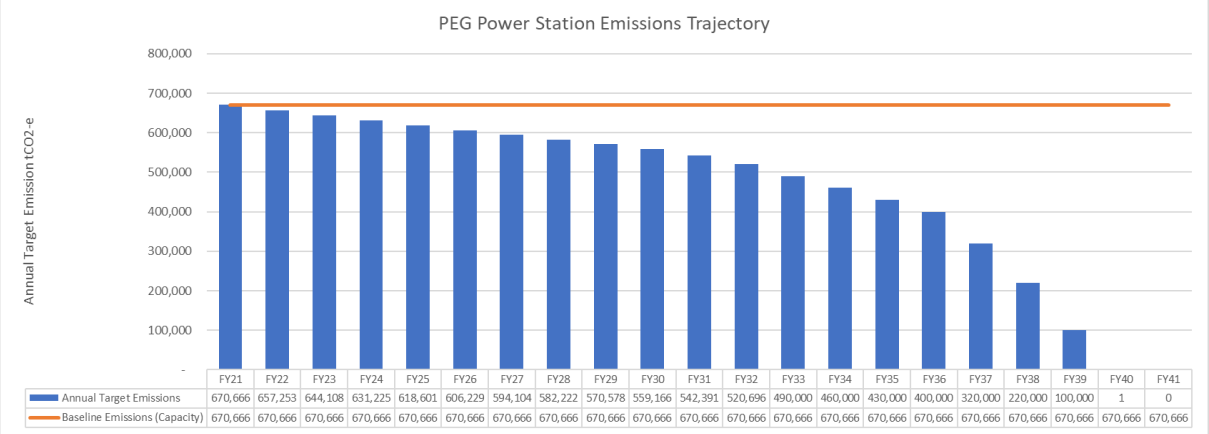
In addition to the 2040 net zero target, Fortescue commits to investigating and implementing emissions reduction opportunities, specific to the PEG Program that will result in progressive emissions reduction over time and contribute to Fortescue's 2040 target.

Current emissions reduction opportunities, although unscheduled at this time, may include:

- Increased generation of renewable energy via extension to the 'in plan' 150MW of solar generation. Additional renewable generation via options such as further solar or wind energy generation, may reduce the production requirement from the PEG Power Station;
- Installation of large-scale energy storage solutions. Large scale battery storage options are currently being considered by Fortescue, to assist its drive for low emissions energy. Batteries may be used in the future in lieu of a gas turbine to provide spinning reserve on the grid to counter issues relating to faults or other loss in electrical supply on the network;
- Development and implementation of an integrated Power Management System (PMS). The future interconnection of all Fortescue's energy generation assets will be controlled by an advanced PMS that will ensure energy generation is matched closely with energy demand across all facilities. Matching the generation assets to the demand requirement, and minimising surplus energy generation, will result in lower GHG emissions across the network;

- Future fuel blending. The PEG Power Station assets have been procured with the understanding of their capability to operate on a gas-hydrogen fuel blend. Upon the establishment of stable supply, transport and storage options for hydrogen fuel, an emissions reduction proportionate to the percentage hydrogen blend is expected to be achieved.

The intended PEG Power Station related net emissions (reduction) targets, compared to the baseline, are illustrated in Figure 3 below.



	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	FY36	FY37	FY38	FY39	FY40	FY41
Annual Target Emissions	670,666	657,253	644,108	631,225	618,601	606,229	594,104	582,222	570,578	559,166	542,391	520,696	490,000	460,000	430,000	400,000	320,000	220,000	100,000	1	0
Baseline Emissions (Capacity)	670,666	670,666	670,666	670,666	670,666	670,666	670,666	670,666	670,666	670,666	670,666	670,666	670,666	670,666	670,666	670,666	670,666	670,666	670,666	670,666	670,666

Figure 3. Intended PEG Power Station Net Emissions Trajectory to 2040

3. COMPLIANCE

Fortescue ensures compliance with its legal obligations through first party quality assurance by site environment teams with a focus on effective environmental management through the corporate Environmental Management System (EMS).

Fortescue has adopted a risk-based approach to monitor compliance with its legal obligations. Site environment teams will monitor their compliance with this Plan and the required site-specific management and monitoring programs using the *Self-Verification of High Risk Environmental Legal Obligations Guideline* (100-GU-EN-0030). Where non-conformance issues are identified these will be documented and managed via Fortescue's Business Management System (BMS).

4. REVIEW OF PLAN

This Plan will be reviewed every five years, or as required by an approval condition. Revisions of this Plan will be submitted to the EPA for approval, in accordance with relevant approval conditions.

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