

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

Aurizon Holdings Limited is a top-100 ASX-listed company offering rail and road-based freight transport and infrastructure solutions across Australia. The name Aurizon conveys the geographical scope of our expanding operations across Australia and our aspirations spanning the Australian horizon. Our priority is our customers and we are working hard to deliver cost-effective, flexible and reliable solutions to keep our customers' freight moving in the right direction. Every day we move thousands of tonnes of coal, iron ore and other minerals as well as agricultural and general freight around the nation. We have proven capabilities to meet the challenges of providing bulk freight and logistics solutions for a wide range of customers and commodities. Aurizon operates and manages the Central Queensland Coal Network made up of approximately 2,670km of heavy haul rail infrastructure. We also provide a range of specialist services in rail design, engineering, construction, management and maintenance.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Row 1	July 1 2016	June 30 2017	No	<Not Applicable>
Row 2	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Row 3	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Row 4	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>

C0.3

(C0.3) Select the countries/regions for which you will be supplying data.

Australia

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

AUD

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your consolidation approach to your Scope 1 and Scope 2 greenhouse gas inventory.

Operational control

C-TO0.7/C-TS0.7

(C-TO0.7/C-TS0.7) For which transport modes will you be providing data?

Rail

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Board/Executive board	The Aurizon Board has ultimate responsibility for climate change & is guided by the Board Safety, Health & Environment (SHE) Committee which includes several board members, including the Board Chairman, & Managing Director & Chief Executive Officer. Aurizon's Audit, Governance & Risk Management Committee (Board Committee) focusses on assessing risks including risks related to climate change. The CEO Forum & Central SHE Committee support the SHE Board Committee as well as Aurizon's Sustainability Steering Committee which has broad cross-functional representation (Strategy & Corporate Development, SHE, Investor Relations, Brand & Communications). It is responsible for guiding the direction & progress of Aurizon's Sustainability Strategy. Sustainability & climate risk factors are incorporated into Aurizon's investment framework through the Investment Committee and Investment Approval Request process. This requires consideration of sustainability issues as part of capital spend approval.

C1.1b

(C1.1b) Provide further details on the board’s oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – some meetings	Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding annual budgets Reviewing and guiding business plans Setting performance objectives Monitoring implementation and performance of objectives Overseeing major capital expenditures, acquisitions and divestitures	The Aurion Board is ultimately responsible for risk management, which considers a wide range of social, environmental and economic risks within enterprise strategic planning. The involvement of the Aurizon Board is central to the company’s approach to sustainability. The company’s strategy has been set with consideration of risks. The Board is focussed on overseeing management of risks that include long term sustainability an strategic risk (including those associated with climate change).

C1.2

(C1.2) Below board-level, provide the highest-level management position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Risk committee	Assessing climate-related risks and opportunities	Annually
Other committee, please specify (Central Safety Health & Environment Ctte)	Both assessing and managing climate-related risks and opportunities	As important matters arise
Sustainability committee	Both assessing and managing climate-related risks and opportunities	As important matters arise

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored.

1) Aurizon's Audit, Governance & Risk Management Committee (AGRMC) (Risk Committee) is a Committee of the Board which oversees the process for identifying and managing material risks in the Company in accordance with the Company's Risk Policy and AGRMC charter (including oversight of material risks associated with climate change). In FY2017, guided by the AGRMC, Aurizon updated its risk assessment approach using the Financial Stability Board's (FSB) Task Force on Climate-related Financial Disclosures (TCFD) recommendations. 2) Safety Health and Environment (SHE) Committee: Aurizon's Board is guided by the Board SHE Committee and includes several board members, including the Board Chairman, and Managing Director and Chief Executive Officer. As per Aurizon's SHE Committee Charter, the purpose of the committee is to review and make recommendations to the Board on the following matters (not limited to the following): (a) Environmental and safety strategy, policies, internal governance and internal control arrangements and performance against stated objectives and targets (b) Environmental and safety risk profiles, strategy and policies. In addition, Aurizon's Central Safety Health and Environment Committee (CSC) supports the SHE Committee and includes Aurizon's Managing Director and CEO, group level, business unit (operations) and corporate division managers. The Central SHE Committee meets on monthly basis regarding SHE performance, governance and strategy. 3) Aurizon's Sustainability Steering Committee and Working Group (Sustainability Committee) is a management level committee and has broad cross-functional representation, with members from Strategy and Corporate Development, Safety, Health & Environment, Investor Relations, Brand and Communications. Meeting quarterly, the Sustainability Committee is responsible for guiding the direction and progress of the Enterprise Sustainability Strategy (incorporating consideration of climate policy and regulation, market research, stakeholder feedback and risk).

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

Yes

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues.

Who is entitled to benefit from these incentives?

Corporate executive team

Types of incentives

Monetary reward

Activity incentivized

Energy reduction target

Comment

The corporate executive team are responsible for delivering Enterprise wide KPIs and receive bonuses based on performance (i.e. achievement of 'operational performance' energy reduction targets).

Who is entitled to benefit from these incentives?

Energy manager

Types of incentives

Monetary reward

Activity incentivized

Energy reduction target

Comment

Targets included within individual Plan Perform Review templates (performance review process) and reviewed regularly to monitor progress.

Who is entitled to benefit from these incentives?

Energy manager

Types of incentives

Monetary reward

Activity incentivized

Efficiency project

Comment

Targets included within individual Plan Perform Review templates (performance review process) and reviewed regularly to monitor progress.

Who is entitled to benefit from these incentives?

Environment/Sustainability manager

Types of incentives

Monetary reward

Activity incentivized

Emissions reduction target

Comment

The Environment Manager and team are responsible for managing the strategic and compliance aspects of climate change. These employees are performance assessed against targets.

C2. Risks and opportunities

C2.1

(C2.1) Describe what your organization considers to be short-, medium- and long-term horizons.

	From (years)	To (years)	Comment
Short-term	1	3	In alignment with Aurizon's Corporate Plan (budget) cycle.
Medium-term	3	5	In alignment with Aurizon's Market Plan.
Long-term	5	10	Based on top-down commodity demand forecasts and fleet infrastructure renewal decisions to meet capacity requirements.

C2.2

(C2.2) Select the option that best describes how your organization's processes for identifying, assessing, and managing climate-related issues are integrated into your overall risk management.

Integrated into multi-disciplinary company-wide risk identification, assessment, and management processes

C2.2a

(C2.2a) Select the options that best describe your organization's frequency and time horizon for identifying and assessing climate-related risks.

	Frequency of monitoring	How far into the future are risks considered?	Comment
Row 1	Six-monthly or more frequently	>6 years	Aurizon's Strategy and Corporate Development (incorporating Market Intelligence and Sustainability) team monitor and analyse long term strategic risks and opportunities (with a 10 year outlook). Aurizon regularly makes investment decisions with respect to the deployment of capital into long-life assets. These decisions are underpinned by wide ranging analysis of which a key component is the consideration of climate change trends and the impacts that these may have. These considerations include future commodity demand and supply scenarios as well as emerging technologies, climate change policy in domestic and international markets and scientific data related to potential changes in frequency and severity of extreme weather events. This analysis is regularly reviewed (and considers thermal coal demand every six months) and adapted to ensure the most relevant information is at hand to inform investment decisions.

C2.2b

(C2.2b) Provide further details on your organization's process(es) for identifying and assessing climate-related risks.

The Aurizon Board has ultimate responsibility for Aurizon's consideration of climate-related risk and is guided by the Board Safety, Health and Environment (SHE) Committee and Aurizon's Audit, Governance and Risk Management Committee as part of Aurizon's broader corporate strategy and planning. In 2017, Aurizon updated the company's risk assessment approach using the Financial Stability Board's (FSB) Task Force for Climate-related Financial Disclosures (TCFD) recommendations, which outline four 'core' elements for disclosing climate related risks including: Governance, Strategy, Risk Management and metrics and targets. At the company level, climate change risks and opportunities are identified and managed through a multidisciplinary approach. This approach involves, depending on the specific topic, consideration by Enterprise Risk, Strategy and Corporate Development, Environment, Operations Technology, Engineering, Sustainability, Policy & Stakeholder Relations, Legal and Finance teams. For example, the Environment team is responsible for keeping the business informed of developments regarding policy and regulation associated with climate change. Other areas such as changes in locomotive technology, potential stranding of assets, extreme weather events and investment opportunities are considered by a range of teams including Finance, Energy, Engineering, Environment, Policy & Stakeholder Relations, Legal and Enterprise Risk to identify any associated risks or opportunities for the business when evaluating potential investments. At the asset level, Aurizon undertakes comprehensive risk assessments to understand the vulnerability of its assets to climate change and identify opportunities for improvement. In response to these risks, such as extreme weather events, Aurizon has strengthened its resilience capability through the implementation of a Network Condition program. As a result of this program a number of opportunities have been identified to improve the resilience of the organisation's network assets. These include advanced hydrology mapping to inform design to mitigate the risk associated with flooding due to extreme weather events, culvert upgrades and renewals, drainage clearance, placement of critical infrastructure above 1 in 100 year flood levels, investment in new technology (drones) to conduct real-time asset condition monitoring, real-time heat monitoring of the network, dispersion of critical infrastructure, and hardening of bridges. Aurizon also undertakes extensive rail corridor vegetation management to mitigate the risks of bushfires. As indicated, Aurizon has aligned the organisation's assessment of risk with TCFD recommendations which include both historical and forward looking analysis when considering the potential financial impacts of climate change. Incorporating the above framework, Aurizon's Enterprise Risk Management Framework is focused on assessing and managing business risks including long term sustainability and strategic risk. A broad scope of risks are considered and prioritised on the basis of materiality, utilising Aurizon's Board approved Enterprise Risk Management Framework. Identified risks are rated with reference to the enterprise specific risk matrix which is aligned with the Aurizon Board's risk appetite. The risk management process is consistent with ISO 31000 and assesses business risks using the enterprise consequence and likelihood tables provided within the enterprise risk matrix. Effectiveness of existing controls that treat the identified risks are taken into consideration to determine the current risk rating. This risk rating is then reviewed against a Risk Tolerance Table which provides guidance on required action and communication level relevant for the rating level. Risks are prioritized based on their rating, with the highest rated risks (with consideration of existing controls) given priority.

C2.2c

(C2.2c) Which of the following risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Aurizon considers Carbon liability under the Safeguard Mechanism Rule and potential penalties for inappropriate carbon reporting under the National Greenhouse and Energy Reporting (NGER) Act. NGER: Aurizon's greenhouse gas emissions and energy reporting data is independently audited on an annual basis as required under the NGER Act. Safeguard Mechanism: Facilities exceeding their emissions baseline may require the need to purchase Australian Carbon Credit Units (ACCUs) per tonne of CO2e exceeded. Aurizon assesses the future liability under the Emissions Reduction Fund Safeguard Mechanism.
Emerging regulation	Relevant, sometimes included	Aurizon considers emerging domestic regulation such as; the outcomes of the Australian Government's 2017 review of climate change policies; the proposed design of the National Energy Guarantee (NEG), and proposed amendments to the Safeguard Mechanism and regulation supporting state level emissions targets. Emerging domestic regulation is considered in light of the potential for incremental additional legislative changes to erode cost competitiveness over time. In addition to domestic regulation Aurizon considers emerging regulation from an international perspective e.g. related to emissions reduction commitments in thermal coal import countries such as Emissions Trading Schemes in China and South Korea, Power plant efficiency standards, and renewables subsidies across Asia. Emerging international regulation is largely considered in terms of long term demand for coal haulage services and the impacts of a structural shift away from thermal coal.
Technology	Relevant, sometimes included	Technology costs are considered in light of thermal coal demand, for example, increased coal fuelled energy capacity in the ASEAN region, with almost half expected to make use of High Efficient Low Emissions (HELE) technology which favours high quality coal.
Legal	Relevant, sometimes included	Aurizon considers the risk of increasing direct action or legal challenges from activist groups targeting the mining sector, particularly in relation to activist groups prosecuting an agenda or legal challenges to required government approvals.
Market	Relevant, always included	Aurizon considers the risk of thermal coal divestment and perception of exposure to fossil fuels. Long term demand for coal haulage services is also considered with regards to a structural shift away from thermal coal. Aurizon continues to undertake scenario analysis in strategic planning with reference to the International Energy Agency's (IEA) scenarios and World Energy Outlook (WEO) including the Current Policies Scenario (CPS), New Policies Scenario (NPS), 2 Degree Scenario (2DS) and Sustainable Development Scenario (SDS).
Reputation	Relevant, always included	Aurizon considers the risk of inadequate disclosure of climate related risks under Australian Securities Exchange (ASX) Corporate Governance principles. Aurizon produces an annual sustainability report utilising the Global Reporting Initiative's (GRI) framework for identifying and implementing material reporting information.
Acute physical	Relevant, sometimes included	Aurizon considers the risk of increasing frequency or severity of extreme weather events which may reduce the capacity or availability of Aurizon's train and track assets.
Chronic physical	Relevant, sometimes included	Aurizon considers long term modelling of sea level changes (potential threats to assets and access) and average temperature increases (implications for rail infrastructure assets).
Upstream	Relevant, always included	Aurizon considers upstream climate-related risk. For example, in connection with reputation risk based on mining company finance.
Downstream	Relevant, always included	Aurizon considers downstream climate related risk in connection with market demand risk for commodities hauled by Aurizon. For example, Aurizon regularly monitors thermal coal demand and publishes a 'Future of Coal' chapter in its annual Sustainability Report. Refer to page 26 of Aurizon's FY2017 report.

C2.2d

(C2.2d) Describe your process(es) for managing climate-related risks and opportunities.

Aurizon's process for identifying, assessing and managing climate-related risks and opportunities are integrated into multi-disciplinary, company-wide risk identification, assessment and management processes. When making decisions related to the mitigation, transfer, acceptance or control of climate related risks and / or decisions to capitalise on identified opportunities, Aurizon utilises the Company's Board approved Risk Management Framework which incorporates risk appetite as a key component of setting the strategic direction of the company. Aurizon recognises that risk appetite is dynamic, evolving through time and responsive to a number of different drivers. Risks are prioritised in accordance with our Board approved Enterprise Risk Management Framework and rated using our enterprise risk matrix, aligned with the Aurizon Board's risk appetite. The risk management process is consistent with ISO 31000. Effectiveness of Existing controls that treat the identified risks are taken into consideration to determine current risk rating. This risk rating reviewed against a Risk Tolerance Table which provides guidance on required action and communication level relevant for the rating level. Risks with the highest rating are given priority. Risks can be assessed on short to long term basis, depending on scope. We consider a wide range of risks, and have prioritised the most material utilising the above processes. E.g. we have identified thermal coal demand as a key risk due to a high level of exposure to energy policy, regulation, technology and market shifts that are necessary to achieve the transition to a low carbon economy, resulting in potential impacts to approximately one half of Aurizon's rail haulage revenues. Aurizon has identified measures to manage this risk, including monitoring long term trends and changes to indicators, comparison of scenario analysis, mine variability analysis. In relation to physical risk, Aurizon has identified exposure to extreme weather events as a key risk due to current and future disruption arising from increased severity and /or frequency of extreme weather events (including higher temperatures, more frequent flooding bushfires etc.), resulting in potential loss of revenue and increasing costs associated with damage to assets. Aurizon has identified specific measures to manage these risks including building resilience into asset design and renewal processes.

Aurizon's risk management approach also enables Aurizon to identify opportunities for improvement. For example, at the asset level, a number of opportunities have been identified to improve the organisation's network assets as a result of the implementation of Aurizon's Network Condition program. In relation to opportunities, areas such as changes in locomotive technology, potential stranding of assets, extreme weather events and investment opportunities are considered by a range of teams including Finance, Energy, Engineering, Environment, Policy & Stakeholder Relations, Legal and Enterprise Risk to identify opportunities for the business when evaluating potential capital investments, process improvements and, policy positioning and stakeholder engagement. For example, in relation to the competitiveness of the rail sector in Australia, Aurizon has sought to educate stakeholders regarding the inherent energy efficiency and emissions intensity advantages associated with rail freight transportation (approximately 75% less emissions intensive per tonne of freight hauled when compared with road freight transportation). In addition, in response to State and Federal level climate and energy policy design, Aurizon has sought to communicate the advantage of Aurizon's electrified traction network in Central Queensland, which offers an additional 13% emissions intensity improvement when compared with diesel traction. This advantage is set to increase under the Queensland Government's 50% renewable energy target by 2030. Under the Commonwealth's proposed National Energy Guarantee, Aurizon has highlighted the risk of fuel switching associated with rising electricity costs where diesel locomotives provide a feasible technical alternative to electric traction despite the energy and emissions efficiency advantage.

As exemplified above, Aurizon's processes for managing climate-related risks and opportunities allow for consideration of complex scenarios and the formation of consistent positioning when engaging with key stakeholders related to key risks and opportunities.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Supply chain

Risk type

Transition risk

Primary climate-related risk driver

Policy and legal: Mandates on and regulation of existing products and services

Type of financial impact driver

Policy and legal: Write-offs, asset impairment, and early retirement of existing assets due to policy changes

Company- specific description

Thermal Coal Demand: Demand for thermal coal is subject to government energy policy, regulation of GHG emissions (including carbon pricing), technology costs, economic reform, trade policy, foreign exchange rates, energy prices and urban and air quality standards.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

High

Potential financial impact**Explanation of financial impact**

Approximately 25% of Aurizon's total revenue relates to thermal coal that uses Aurizon's network or is carried by Aurizon's above rail (haulage) business. The related revenues are largely protected under a regulatory mechanism (Network) or above rail take-or-pay contracts (~70% of revenues fixed and no material contracts due to expire until FY2022). As such the financial implications of climate change policy are not material in the next 3-5 years. Going forward Australia's high quality coal is likely to support an increase in market share that may offset any declines in seaborne thermal coal demand.

Management method

Aurizon incorporates this risk into business strategy and planning through forecasting and scenario analysis. For example, Aurizon models demand for coal services based on global demand for seaborne metallurgical and thermal coal driven by factors such as, steel production, energy generation (and fuel mix) and seaborne import dependency. The key components to Aurizon's management strategy in response to this risk are outlined as follows: - Continue to monitor longer-term trends and changes to key indicators, such as electricity generation capacity in Asian nations, feeding into scenario analysis. - Continue to compare Aurizon's scenario analysis with a range of projections (e.g. International Energy Agency, BP and Wood Mackenzie). - Continue to undertake mine viability analysis (based on coal quality, mine life, expandability and profitability) to increase exposure to mines that are expected to maintain competitiveness. - The main metrics used to monitor this risk comprise coal demand and supply projections including those sourced from the International Energy Agency World Energy Outlook.

Cost of management

300000

Comment

Costs associated with monitoring demand and policy shifts in key markets and globally are undertaken by Aurizon's Market Intelligence and Sustainability team. It is estimated this costs between \$300,000-\$500,000.

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Customer

Risk type

Transition risk

Primary climate-related risk driver

Reputation: Increased stakeholder concern or negative stakeholder feedback

Type of financial impact driver

Reputation: Reduction in capital availability

Company- specific description

Access to Funding and; Licences: Investor concern over climate-related risks may result in higher cost of capital for Aurizon and its customers for funding coal mining, transport and coal-fired power projects.

Time horizon

Medium-term

Likelihood

About as likely as not

Magnitude of impact

Medium

Potential financial impact**Explanation of financial impact**

Refinancing of existing borrowing facilities or development of new mines, greenfield rail infrastructure and coal-fired power may incur increased borrowing costs, delays in approvals or restrictions on licence conditions impacting growth opportunities. It is also acknowledged that any reputational damage could impact the company's share price negatively. A potential financial impact has not been provided given the inherent breadth and nature of this risk however, Aurizon continues to monitor seaborne thermal coal demand and has included a 'Future of Coal' section, incorporating outcomes of scenario analysis in its annual sustainability report publication since FY2014.

Management method

The key components to Aurizon's management strategy in response to this risk are outlined as follows. Aurizon: - Continues to advocate the ability of Australia's metallurgical coal (and Australia's export infrastructure advantage) to underpin global metallurgical coal supply, used in steel production. - Continues to advocate the importance of Australian high quality thermal coal supply, used for energy generation and contributing to a reduction in greenhouse gas emissions relative to lower quality alternatives. - Maintains access a broad range of capital markets and diversify funding sources / extend tenure where possible. - Participates in the World Coal Association to support investment in High Efficiency Low Emission coal technology.

Cost of management

300000

Comment

The cost of management is considered as part of business as usual management costs and is supported by Aurizon's Market Intelligence and Sustainability team and commercial functions. It is estimated this costs between \$200,000 - \$300,000 per annum based on engagement and time invested.

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Policy and legal: Enhanced emissions-reporting obligations

Type of financial impact driver

Policy and legal: Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

Carbon Emissions and Energy Consumption Reporting Liability: Carbon liability under the Australian Government's Safeguard Mechanism Rule and potential penalties for inappropriate carbon reporting under the National Greenhouse and Energy Reporting (NGER) Act.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Medium

Potential financial impact

220000

Explanation of financial impact

Facilities exceeding respective emissions baselines may be required to purchase Australian Carbon Credit Units (ACCUs) per

tonne of CO₂e exceeded to meet carbon abatement obligations under the Safeguard Mechanism. The average price of ACCUs over the FY2017 period was \$14 per tonne. In addition, significant penalties apply in relation to non-compliance with the NGER Act 2007, with maximum civil penalties of \$220,000 and daily penalty provisions for continuing offences. The provided figure (\$220K) has been provided on this base as an inherent financial risk.

Management method

Aurizon has implemented the following strategies to manage this risk: Assess future liability under the Emission Reduction Fund Safeguard Mechanism (current analysis indicates Aurizon's baselines are not expected to be surpassed prior to 2020 with provision to amend baselines or defer requirement to acquire ACCUs); Incorporates carbon prices into fleet purchase decisions when considering electric vs. diesel locomotives; Continues to focus on reducing GHG emissions through the achieving a locomotive emissions intensity reduction target of 15% by FY2020 (from FY2015), driven by lower energy use and using lower-emissions sources; Transfer of energy risk to customers via cost pass through mechanism; Continues to engage with policymakers directly and through membership of the Carbon Market Institute; Participate in domestic carbon offset markets (e.g. Emissions Reduction Fund); Aurizon maintains appointed a dedicated full time position responsible for compliance with the NGER Act 2007. This position is responsible for developing and maintaining the NGER reporting system, defining facility boundaries, correctly applying overall and operational control, collating and validating greenhouse and energy data, performing calculations and submitting the NGER data to the Regulator. The position is also responsible for additional (non statutory) tasks that support NGER reporting such as developing training materials, reporting templates and the NGER management guide (risk reduction).

Cost of management

65000

Comment

Costs associated with compliance relate to the time spent by staff to ensure compliance with the NGER Act 2007 and investment in new, updated reporting and management systems, and external assurance costs. On average, it is estimated this costs the organisation between \$50,000 - \$65,000 per annum.

Identifier

Risk 4

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

Acute: Increased severity of extreme weather events such as cyclones and floods

Type of financial impact driver

Reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions)

Company- specific description

Exposure to extreme weather events Current and future disruption arising from increased severity and / or frequency of extreme weather events such as cyclones and floods. (higher temperatures, strong winds, flooding and associated erosion, bushfires and others).

Time horizon

Long-term

Likelihood

Very likely

Magnitude of impact

High

Potential financial impact

68000000

Explanation of financial impact

Physical (acute) climate change risk associated with increasing frequency and severity of extreme weather events may result in loss of revenue due to extreme weather events affecting mining, transport and port activities across the supply chain. For example, the category four tropical cyclone (Debbie) that hit Queensland during late March / early April 2017 impacted approximately 70% of the Company's asset base and for the first time in the company's history, all four coal systems that make up the Central Queensland Coal Network (CQCN) were closed at the same time. The impact on earnings from Tropical cyclone Debbie in FY2017 was approximately \$89 million (EBIT). Through established regulatory processes of Aurizon's below rail (network) business, \$69 million of this impact is expected to be recovered in future years. The Cyclone Debbie EBIT impact comprises the following in: Above Rail Commercial & Marketing: \$16M Operations: \$4M Below Rail Access revenue: \$48M

Management method

Aurizon continues to design infrastructure and focus on improving the resilience of its Network infrastructure to recover quickly from flooding and extreme weather events including the positioning of inventory such as ballast, flood rock, rail and formation material, hardening of assets, isolation of electrical assets and designing overhead infrastructure to withstand winds. Aurizon Network's 'NETCON' management system incorporates extreme weather event monitoring, weather station monitoring (rail stress, air temp, rainfall, wind speed), rock fall detectors, slip detectors, creek and river height monitoring systems. In March 2017, Aurizon's CQCN was impacted by TC Debbie which caused all coal ports to cease operation. TC Debbie made landfall on the mainland near Airlie Beach, south of Abbott Point Coal Terminal. All of Aurizon's four coal systems were closed with many track sections unable to operate until two weeks after the cyclone. During this period Aurizon focussed on maintaining engagement with customers on the estimated recovery timelines by providing an initial range which was narrowed in line with increasing certainty. After the TC Debbie event, Aurizon worked with supply chain stakeholders to ensure the best recovery possible. For example, subject to access undertaking obligations, Aurizon Network offered alternative routing opportunities to Abbot Point Coal Terminal, and to the Port of Gladstone.

Cost of management

5000000

Comment

The cost of management in relation to more extreme weather events (e.g. related to increased precipitation) is estimated to be between \$4-5 M.

Identifier

Risk 5

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

Chronic: Changes in precipitation patterns and extreme variability in weather patterns

Type of financial impact driver

Reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions)

Company- specific description

Changes in precipitation patterns and increasing extreme variability have the potential to cause disruption and damage to Aurizon's network through submerged and / or infrastructure wash-outs. Customer's assets and infrastructure may also be impacted. For example, flooding impacting mines and agricultural lands may result in reduced commodity output, delays and inaccessibility. Aurizon services may not be able to feasibly transport relevant commodities to their destination.

Time horizon

Long-term

Likelihood

Very likely

Magnitude of impact

Medium-high

Potential financial impact

Explanation of financial impact

It is difficult to estimate the cost associated with long term changes in precipitation patterns based on available data. However, where related events have occurred that impact a particular system the financial implications can be estimated. For example, from a physical infrastructure perspective (i.e. formation, rail, ballast, drainage, bridges and access roads) such impacts have the potential to result in increased costs associated with ensuring asset availability or to address damage to assets. Aurizon's Central Queensland Coal Network (CQCN) incurred costs of approximately \$21M in association with flood repair works following TC Debbie in 2017.

Management method

Implementation of the 'NETCON' management process that includes management methods such as pre wet-season inspections of infrastructure, culvert upgrades and renewals, drainage clearance, placement of electrical infrastructure housings above 1 in 100 year flood levels, relocations of control system equipment housings to safer locations (including the installation of backup generators (where there are not already)) in locations which are hard to during extreme weather events and hardening of bridges. For example, new sleeving technology for culverts has been on the network that extends the life and performance of existing culverts, reducing the risk of track washouts, including conducting full hydrology studies for each site prior to culvert

upgrades/renewals as standard practice. In 2017 Aurizon participated in a CSIRO Adaptive Mining Supply Chains workshop to help direct future development of support tools to assess the risk and an impacts of climate change across mining supply chains.

Cost of management

5000000

Comment

Identifier

Risk 6

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

Chronic: Rising mean temperatures

Type of financial impact driver

Reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions)

Company- specific description

Changes in temperature extremes has a direct impact on Aurizon's railway network. Extreme temperature in Central Queensland (over the reporting period) resulted in track buckling, broken rails, pull aparts and cracked rails across the network. This compromises the integrity o the track and can result in derailments or other incidents. Speed Restrictions are implemented across the network to reduce these risks, which reduces the operating efficiency of the network.

Time horizon

Medium-term

Likelihood

Very likely

Magnitude of impact

Medium-low

Potential financial impact

10000000

Explanation of financial impact

Aurizon has estimated the financial implications of track buckling, broken rails, pull aparts and cracked rails to be in the order of \$4-5 million. These cost estimates are associated with train delays and cancellations. Additionally, the organisation has estimated that the impact on operations of speed restrictions placed on locomotives relating to high temperatures is \$6-10 million per annum.

Management method

Aurizon carries out regular inspections of the rail network. For example, the organisation has a Rail Track Inspection Vehicle that carries out additional inspections when the temperature exceeds 38 degrees Celcius. Blanket speed restrictions are also applied to reducethe risk of a derailment. Sections are repaired as required by welding sections into the rail and restressing. An additional example, has been the improvements in stress free temperature (SFT) management which reduces the frequency of these faults. Installing the proper SFT greatly reducesthe risks of fracturing or buckling of the rail in extreme temperatures. Continued improvements have also been seen since the install of Laser Creep Monitoring with rail stress changes and indentifying high risk buckle zones so remideal retification works can be carried out proactively before critical safety issues and/or impact to operations are encountered.

Cost of management

4000000

Comment

The cost of management in response to temperature related impacts (including track buckles, broken rail, track defects, track misalignments / kinks, rail weld defects is estimated to be \$3-4 Million for maintenance and renewal works on the network.

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Opp1

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Resilience

Primary climate-related opportunity driver

Other

Type of financial impact driver

Other, please specify (Reduced operational costs)

Company- specific description

Improvement in emissions management, reporting and monitoring via reporting under the NGER scheme, which is a legislative requirement for Aurizon. Additional improvement is also targeted through the third party assurance process that Aurizon undertakes on a voluntary basis for its Scope 1 & 2 emissions, with recommendations listed in the final audit report reviewed and implemented where appropriate.

Time horizon

Current

Likelihood

Virtually certain

Magnitude of impact

Low

Potential financial impact

20000

Explanation of financial impact

Updating the current internal NGER procedures, management guide and system is estimated to cost \$10,000- \$20,000 based on a product of time and labour.

Strategy to realize opportunity

This opportunity is being managed by a dedicated position who is responsible for all aspects of compliance with the NGER Act and improving Aurizon's systems and procedures. For example, following the implementation of Aurizon's bespoke NGER reporting system in FY2016, time taken to complete reporting and present Aurizon's annual report to the external auditors has been reduced. The new system streamlined reporting and integration of government amendments emissions estimation techniques and the audit process, thus reducing the cost associated with reporting.

Cost to realize opportunity

65000

Comment

Identifier

Opp2

Where in the value chain does the opportunity occur?

Supply Chain

Opportunity type

Markets

Primary climate-related opportunity driver

Use of public-sector incentives

Type of financial impact driver

Other, please specify (Modal shift and financial incentives)

Company- specific description

Domestic climate policy shift towards the introduction of emissions trading and / or cap and trade schemes linked with international carbon markets is likely to increase financial incentives and reduced operational costs associated with a modal shift towards more efficient forms of transportation.

Time horizon

Medium-term

Likelihood

More likely than not

Magnitude of impact

Medium

Potential financial impact**Explanation of financial impact**

The financial implications are difficult to estimate given such a scheme is not operating in Australia currently. However, given the cost of abatement during the Emissions Reduction Fund auction process reached approximately \$12/tCO₂-e and spot markets reached \$18/tCO₂-e (and projected to increase to approximately \$35/tCO₂-e by 2030) the potential cost impact could be significant and drive customers to less emissions intensive forms of transportation such as rail.

Strategy to realize opportunity

This opportunity is being managed through a range of disciplines at Aurizon that monitor potential policy changes and their potential implications for the organisation. For example, briefing papers are regularly developed by the Environment, Market Intelligence and Sustainability, Policy and Energy teams. Reviewing both domestic and international shifts in climate policy and/or agreements. These papers are then presented to relevant committees such as the Environment Community of Competence and the Sustainability Steering Committee. These papers are also presented to relevant committees of the Board as required.

Cost to realize opportunity

300000

Comment

The cost of management is considered as part of business as usual management costs and is supported by Aurizon's Environment, Policy and Market Intelligence teams. It is estimated this costs between \$200,000 - \$300,000 per annum based on engagement and time invested.

Identifier

Opp3

Where in the value chain does the opportunity occur?

Supply Chain

Opportunity type

Markets

Primary climate-related opportunity driver

Use of public-sector incentives

Type of financial impact driver

Increased revenues through access to new and emerging markets (e.g., partnerships with governments, development banks)

Company- specific description

Active engagement with industry and policymakers to improve awareness and support policies/strategies that support the movement of freight from road to rail to reduce carbon emissions, congestion and accidents.

Time horizon

Short-term

Likelihood

Virtually certain

Magnitude of impact

Medium

Potential financial impact

Explanation of financial impact

It is difficult to estimate the amount of business captured as a direct result of these policies/strategies being implemented associated with policy uncertainty. As such, Aurizon is yet to quantify the financial implications associated with this opportunity. Aurizon continues to monitor policy developments under proposed amendments to the Safeguard Mechanism, the proposed National Energy Guarantee and general climate and energy policy positioning. Aurizon anticipates increasing costs associated with energy reliability and emissions management (including carbon abatement) over a medium term time horizon.

Strategy to realize opportunity

The opportunity is being managed through business as usual activities (i.e. corporate development/business development) and investment in business improvement activities.

Cost to realize opportunity

300000

Comment

The cost of management is considered as part of business as usual management costs and is supported by Aurizon's Environment, Policy and Market Intelligence teams. It is estimated this costs between \$200,000 - \$300,000 per annum based on engagement and time invested (this cost is not in addition tho those identified against Opp 2).

Identifier

Opp4

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Shift in consumer preferences

Type of financial impact driver

Better competitive position to reflect shifting consumer preferences, resulting in increased revenues

Company- specific description

Changes to physical climate parameters such as extreme weather events causing flooding or bushfires, could significantly impact road freight transportation. Such an impact could result in a shift toward rail freight and benefit Aurizon through increased business.

Time horizon

Long-term

Likelihood

About as likely as not

Magnitude of impact

Medium

Potential financial impact

Explanation of financial impact

The financial implications associated with this opportunity are yet to be quantified by Aurizon. However, as the impacts of climate change continue to be realised, and our customers seek a more carbon efficient method of moving their freight, it is anticipated this will lead to increased business for the organisation.

Strategy to realize opportunity

Aurizon makes strategic, long term investments in its rail network and locomotive fleet to match the markets demand and provide exceptional customer service. For example, this has included undertaking a review of train configurations, reducing turnaround times and improving payloads to increase the productivity of assets and manage increasing demand while reducing energy consumption and emissions.

Cost to realize opportunity

Comment

The cost to manage this increase is difficult to calculate. Costs may include upgrades to infrastructure to accommodate the increase in rail freight

Identifier

Opp5

Where in the value chain does the opportunity occur?

Supply Chain

Opportunity type

Products and services

Primary climate-related opportunity driver

Shift in consumer preferences

Type of financial impact driver

Better competitive position to reflect shifting consumer preferences, resulting in increased revenues

Company- specific description

Sustainability is becoming an increasingly prominent issue globally and for Aurizon. Mitigating climate change impacts such as greenhouse gas emissions is an important part of these strategies. With the growing scrutiny and pressure for organisations to understand and mitigate their GHG emissions in their supply chain, comes an opportunity for Aurizon to enhance its reputation amongst customers and other stakeholders by demonstrating the value of our increasingly energy efficient rail freight services.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

Medium

Potential financial impact

15200000

Explanation of financial impact

Financial implications (alongside reduced fuel and energy costs) are derived from the enhanced reputation of the organisation and the potential for this reputational improvement to increase market share for the company. The estimated financial annual monetary savings associated with the implementation of fuel and energy efficiency initiatives has been estimated at approximately \$2.2M. Between FY2016 and FY2021, savings associated with locomotive energy efficiency initiatives have been estimated at approximately \$15.2M. These figures are based on estimated fuel savings.

Strategy to realize opportunity

Aurizon is seeking to further improve the energy efficiency of its fleet and make rail an even more carbon efficient option for existing and potential customers. For example, in FY16 Aurizon committed to a 15% GHG emissions intensity reduction target, based on FY15 performance, by 2020 across its locomotive fleet. To date Aurizon has achieved a 6% reduction against this target.

Cost to realize opportunity

300000

Comment

Costs associated with management is part of the overall operating budget. A rough estimate would be in the range of \$200,000 - \$300,000 per annum.

C2.5

(C2.5) Describe where and how the identified risks and opportunities have impacted your business.

	Impact	Description
Products and services	Impacted for some suppliers, facilities, or product lines	Aurizon's coal business is impacted by global demand for thermal coal which is subject to domestic and; international government energy policy, regulation of GHG emissions, technology costs, economic reform trade policy, foreign exchange rates, energy prices and urban and air quality standards. This risk is considered in business strategy through forecasting and scenario analysis. E.g., we model demand for coal services based on global demand for seaborne metallurgical & thermal coal driven by factors such as, steel production, energy generation, fuel mix & seaborne import dependency. We use multiple sources when undertaking scenario analysis, including the IEA World Energy Outlook. A description of our Scenario analysis is provided in response to C3.1d. We note that 25% of Aurizon's total revenue relates to thermal coal that uses our network or is carried by our above rail business. The related revenues are largely protected under a regulatory mechanism (Network) or above rail take-or-pay contracts (~70% of revenues fixed). As such the financial implications of climate change policy are not material in the next 3-5 years. Going forward Australia's high quality coal is likely to support an increase in market share that may offset any declines in seaborne thermal coal demand. Opportunities: We continue to focus on supporting the movement of freight from road to rail and; relative benefits including reduced carbon emissions, congestion and accidents, by engaging with key stakeholders and policymakers. Road freight is relatively vulnerable to the physical risks linked to climate change and could result in a shift towards resilient rail freight. We acknowledge that sustainability is becoming an increasingly prominent issue globally. Growing scrutiny and pressure for organisations to understand and mitigate GHG emissions in their supply chain presents Aurizon with an opportunity to improve its competitive advantage through improved operational efficiency and reputation gains, by demonstrating the value of our increasingly energy efficient rail services. We make long term investments in its rail network & locomotive fleet to match market demand and customer service requirements. E.g. Our asset investment process considers train configurations, turnaround times, payload and; overall productivity to manage demand whilst reducing energy intensity.
Supply chain and/or value chain	Impacted for some suppliers, facilities, or product lines	Demand for services provided by Aurizon's coal business may be impacted by investor concern over climate-related risks and could result in higher cost of capital for Aurizon and its customers for funding coal mining, transport and coal-fired power projects medium and long term time horizons. For example, refinancing of existing facilities or development of new mines, greenfield rail infrastructure and coal-fired power generation may incur increased borrowing costs, delays in approvals or restrictions on licence conditions impacting growth opportunities. Alongside forecasting and scenario analysis, Aurizon continues to: - advocate the ability of Australia's metallurgical coal (and Australia's export infrastructure advantage) to underpin global metallurgical coal supply, used in steel production; - advocate the importance of Australian high quality thermal coal supply, used for energy generation and contribution to a reduction in greenhouse gas emissions, relative to lower quality alternatives; - access a broad range of capital markets and diversify funding sources / extend tenure where possible; - Participate in the World Coal Association to support investment in High Efficiency Low Emission coal technology. - Focus on improved operating and energy efficiency and reduced operational emissions intensity. - Participate in leading climate change disclosure platforms; Adopt the Financial Stability Boards: Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) released in 2017.
Adaptation and mitigation activities	Not yet impacted	Chronic risks (physical) associated with climate change including changes in precipitation patterns, rising mean temperatures and sea level rise have the potential to reduce supply chain capacity and directly impact Aurizon's operations and infrastructure over a long term time horizon. For example, above average summer temperatures demonstrably result in increased instances of track buckling, broken rails and pull-aparts across Aurizon's CQCN. Reduced track integrity associated with increased ambient temperatures requires the imposition of temporary speed restrictions (TSRs), and reduced productivity. For example, it is estimated that TSRs relating to high temperatures on the CQCN are estimated to cost Aurizon \$6-10 Million per annum. Aurizon considers building resilience into operations and infrastructure as key to the success of the business. In this regard, Aurizon's network business places an emphasis on ensuring its Network Condition Program is continually adapted to improve operational resilience through adaptive design, monitoring, supply chain communication, and preparedness and recovery in relation to severe weather events.
Investment in R&D	Not yet impacted	Aurizon acknowledges that climate related risks have the potential to impact capital and financing for R&D Climate related risk has not been linked with impacts to Aurizon's allocations for R&D however, Aurizon continues to focus and investing in improving the operational energy efficiency of its locomotive fleet to which Aurizon's locomotive emissions intensity reduction target is linked. Aurizon employs a team of fuel and energy specialists to ensure energy efficiency opportunities including technology adoption and research are considered as part of Aurizon's strategy, risk mitigation and corporate planning processes. Aurizon has also brought attention to the additional emissions benefits afforded by using high quality coal with best available technology (such as High Efficiency Low Emission coal technology)(a medium to long term time horizon is considered).
Operations	Impacted for some suppliers, facilities, or product lines	Production capacity and supply chain interruptions impacting Aurizon's services may increase in association with temperature extremes increasing severity and / or frequency of extreme weather events such as cyclones and flooding. For example, it is estimated that during the 2017 reporting period, Tropical Cyclone Debbie resulted in an \$89 million negative impact on earnings (EBIT). It is noted that a majority of the repair costs and capital expenditure will be recovered in future years through recovery processes subject to regulatory approval. Aurizon's Network business considers building resilience into infrastructure design an operation as a business as usual activity, alongside incorporating lessons learned from extreme weather events, improved modelling (e.g. hydrology) and temperature monitoring, Aurizon has focused on improving supply chain engagement and regulatory frameworks to better reflect Aurizon's CQCN as one interconnected system (rather than multiple separate systems) so that contacted access rights can be transferred to alternative mines and systems linked to the CQCN. Aurizon considers these impacts over a medium to long term time horizon.
Other, please specify	Please select	

C2.6

(C2.6) Describe where and how the identified risks and opportunities have factored into your financial planning process.

	Relevance	Description
Revenues	Impacted	Approximately one quarter of Aurizon's network revenues and one half of rail haulage revenues related to continuing demand for thermal coal. Aurizon has identified transition risks (market, policy and legal and technology) that impact thermal coal demand, as representing a key risk in revenue terms over a medium to long term time horizon. These risks have been factored into Aurizon's strategic planning processes through: - Continuing to monitor and hold a view on demand for seaborne thermal coal (particularly in Asia) in addition to the cost and quality of coal supply. - Continuing to undertake and compare scenario analysis with a range of projections (e.g. the International Energy Agency). - Continuing to undertake mine viability analysis (based on coal quality, cost competitiveness and projected mine life).
Operating costs	Impacted	The potential for exposure to carbon abatement costs and liability under Australia's Emissions Reduction Fund Safeguard Mechanism (Safeguard Mechanism) has been identified by Aurizon as a low to moderate transition risk (policy and legal) risk over the medium to long term. Aurizon factors these risks into strategic and financial planning processes by: - Assessing future liability under the Safeguard Mechanism; - Incorporating carbon prices (shadow) into fleet purchase decisions when considering electric vs. diesel locomotives; - Continuing to reduce GHG emissions through initiative linked to Aurizon's locomotive emissions intensity reduction target of 15% by FY2020 (from FY2015), driven by increased energy efficiency and lower emissions energy sources. - Monitoring and engaging with government climate and energy policy agendas and advocate for positive policy outcomes for rail. - Transfer of energy risk to customers via cost pass through mechanisms.
Capital expenditures / capital allocation	Impacted	Refer to access to capital
Acquisitions and divestments	Impacted	Refer to access to capital
Access to capital	Impacted	Investor concern over climate-related risks may result in a higher cost of capital for Aurizon and its customers for funding coal mining, transport and coal fired power projects. Aurizon has identified moderate to high transition risk (reputation) over a short, medium and long term time horizon associated with refinancing of existing borrowing facilities, development of new mines, greenfield rail infrastructure and coal fired power which may incur increased borrowing costs, delays in approvals or restrictions on licence conditions, impacting growth opportunities. Along with continued advocacy for Australia's thermal and metallurgical coal and export infrastructure advantage, Aurizon's strategy includes maintaining access to a broad range of capital markets, diversified funding sources and extended tenure, where possible.
Assets	Impacted	Asset valuation may be impacted by transition risks associated with thermal coal demand, impacting access to markets and capital. Assets (tangible) vulnerable to physical (acute and chronic) impacts of climate change may also incur increased costs associated with ensuring asset availability and repair, for example, in response to severe weather events and flooding. Aurizon has identified potential for moderate to high level physical (acute) risks to network infrastructure assets over a medium to long term time horizon. The organisation has started to factor these risks into financial planning processes, for example, Aurizon's Network business has placed an emphasis on building network infrastructure resilience and takes a targeted approach to capital allocation by assessing infrastructure recovery benefits against capital cost to identify cost effective strategies and projects.
Liabilities	Not impacted	Aurizon has not identified impacts to financial liabilities associated with climate change. Aurizon routinely monitors climate change policy and regulation linked to financial and legal liability for climate related risks.
Other	Please select	

C3. Business Strategy

C3.1

(C3.1) Are climate-related issues integrated into your business strategy?

Yes

C3.1a

(C3.1a) Does your organization use climate-related scenario analysis to inform your business strategy?

Yes, qualitative and quantitative

C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-

ST3.1b/C-TO3.1b/C-TS3.1b)

(C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b)

Indicate whether your organization has developed a low-carbon transition plan to support the long-term business strategy.

In development, we plan to complete it within the next 2 years

C3.1c

(C3.1c) Explain how climate-related issues are integrated into your business objectives and strategy.

1) The influence climate change has had on business strategy has been multi-faceted. Aurizon has sought to provide stakeholders with information about its position on climate change and how the company is managing related risks and opportunities. We have communicated our view on the future of thermal coal, and committed to improving the operational efficiency of our fleet to reduce energy use and GHG emissions; developed customer partnerships to prepare for and adapt to extreme weather events; and closely monitored both domestic and international developments in climate change policy to inform strategy development. In FY2016 Aurizon committed to a five year GHG emissions reduction target, 15% reduction in the GHG emissions intensity of our locomotive fleet by 2020 (using FY2015 as baseline). Locomotive emissions are responsible for approximately 90% of the organisations Scope 1 and 2 emissions, hence our focus on this area. Furthermore, In FY2017 Aurizon updated the organisation's risk assessment approach using the FSB's TCFD recommendations. 2) Climate adaptation and policy have had the greatest influence on Aurizon's strategy. E.g. the need to adapt to prepare for increased extreme weather events has led us to place critical infrastructure above 1 in 100 year flood levels, bridge hardening, culvert upgrades and investing in real-time heat data monitoring of our network to better manage extreme temperatures. In terms of climate change policy, this is influencing our strategy towards how we make capital investment decisions with ongoing monitoring of the demand for the commodities we haul, and the potential impact climate change policies may have on this demand. Aurizon continues to undertake scenario analysis in strategic planning, whereby drivers of uncertainty are identified and outcomes subsequently tested against different outcomes with a particular focus of metallurgical coal and thermal coal which each have distinct demand drivers. 3) For Aurizon, the short term strategy has been influenced by climate change by focusing on reducing our most material impact in relation to GHG emissions, namely, the operation of our locomotive fleet. To achieve this we continue to actively review and make changes to operations, investments e.g. implementation of new fuel efficiency technologies including utilising cleaner, more efficient fuels. In addition, Aurizon applies an internal price on carbon in our business decisions (e.g. mergers, acquisitions) to ensure any potential change to our emissions profile is fully understood. The network side of the business that is responsible for managing the Aurizon's rail network infrastructure and associated assets remains focussed improving resilience to climate change risk. This has led to improved planning and processes focusing on resilience to extreme weather events. This has included investing in real-time heat data monitoring to apply targeted heat restrictions to sections of track affected by extreme heat; advanced hydrology mapping to understand potential flood levels; hardening of infrastructure; placement of infrastructure above Q100 flood levels; and investment in technology to conduct real-time asset condition monitoring. In March 2017, all four of Aurizon's CQCN systems were impacted by Tropical Cyclone (TC) Debbie demonstrating the scale of impact severe weather events can have on productivity and infrastructure. Following TC Debbie, Aurizon is applying key learnings to enhance response capability. Examples include: Positioning strategically placed inventory stockpiles (e.g. flood rock and formation material); Rebuilding slopes affected by major land slips with a flatter gradient, high strength rock and concrete armour; Improving engagement with customers on the estimated recovery timelines; Embedding the mobilisation of spatial imaging tools and drone imagery for events that involve large scale earthworks; and reviewing the opportunity to improve the regulatory framework to better reflect the CQCN as one inter-connected system enabling contracted access rights to be transferred to different systems facilitating the ability for customers to access multiple ports through network. 4) Aurizon recognizes the need to assess and manage the organisation's long-term exposure to thermal coal, by considering issues such as climate change in its strategy development and execution. This is achieved through an objective analysis of four overarching demand drivers; global energy demand, thermal coal's share of the global energy mix, coal quality and coal technology. It also requires specific mine level appraisal of the relative coal quality and cost of production when assessing major capital decisions. A key part of our analysis is the development of scenarios to understand the potential implications of climate change policy for Australia's thermal coal exports. These scenarios include the IEA's (World Energy Outlook 2015) New Policies Scenario and the 450/ 2DS. A key finding of this analysis was the possibility that Australia could sustain or increase coal exports under a '2 degree scenario' if its share of the global seaborne thermal coal market reached 30% before 2030. This likelihood is based on Australia's ability to supply Asia's needs of high-quality coal which is particularly suited to high-efficiency coal-fired power plants. This assessment forms part of Aurizon's transition planning process and forms part of Aurizon's adoption of the TCFD's recommendations which 'focuses on the resilience of an organisation's strategy, taking into consideration different climate related scenarios including a 2oC or lower scenario. In addition to the above, the organisation will demonstrate compliance under the Emissions Reduction Fund Safeguard Mechanism. The Safeguard Mechanism is one of the key tools the Government is using to achieve its Nationally Determined Contribution of 26-28% on 2005 levels by 2030. Currently, Aurizon has four facilities captured under the Mechanism, which requires the organisation to keep emissions below baseline or demonstrate compliance in a number of defined ways. 5) by setting challenging targets and investing in new technologies, fuel and practices to continually improve the energy efficiency of our operations, Aurizon is gaining competitive advantage through cost reduction and offering less carbon intensive alternatives to customers. Aurizon's analysis of the IEA scenarios, monitoring of global climate policy and assessing potential climate change impacts on our assets further enhances Aurizon's competitive advantage. 6) In FY2017 we updated our risk assessment approach in line with the FSB's TCFD recommendations which represents the most substantial climate related business decision made by Aurizon in the reporting year

C3.1d

(C3.1d) Provide details of your organization’s use of climate-related scenario analysis.

Climate-related scenarios	Details
IEA Sustainable development scenario	Aurizon undertakes scenario analysis in strategic planning, whereby drivers of uncertainty are identified and outcomes subsequently tested against different outcomes. Given exposure to coal export volume (through rail haulage and lease of the Central Queensland Coal Network), demand for services provided to Aurizon is modelled based on global demand for seaborne metallurgical and thermal coal driven by factors such as steel production, energy generation (and fuel mix) and seaborne import dependency. Once seaborne demand is calculated, Australia's supply participation is assessed based on competitiveness of supply against competing export nations. Finally, to assess indicative Aurizon volume (both Above Rail and Below Rail) over the projection period, a rail market share is applied to Australia export volume (and adding an estimation of Australia domestic consumption). When developing these scenarios, Aurizon's Market Intelligence team draws upon information and analysis from a wide selection of sources including (but not limited to) subscription services, World Bank, International Energy Agency (IEA) and industry discussions. In addition to these detailed scenarios, the IEA scenarios are also considered discretely given global coverage of the projections, including the Sustainable Development Scenario (formerly known as 2DS or 450 scenario). Given more limited data available for the non-central IEA scenarios, assumptions are required on the participation of Australia in seaborne coal markets. Within Aurizon, scenario analysis is presented on an annual basis to the Board to inform strategic planning. Throughout the year, signposts (indicating the current trajectory and likelihood of achieving the defined scenarios) are monitored by the Market Intelligence team with data/charts/analysis shared across the organisation through a selection of communication methods including (but not limited to): Daily updates, monthly reporting, regular board updates. Although outside of scope of IEA scenarios, the Market Intelligence team also assesses the viability of both the current fleet of coal mines serviced but also potential coal mines that may be served in the future. As part of the business development process, the viability consideration includes assessment of coal quality, cost competitiveness, mine life and counterparty. This assessment informs the resilience of coal demand should lower price and/or volume scenarios take place. External to Aurizon, the IEA scenarios (including estimated Australia participation in seaborne markets) is presented in the annual Sustainability Report.
2DS	Refer to IEA Sustainable development scenario details (above).
IEA 450	Refer to IEA Sustainable development scenario details (above).

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?

Intensity target

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number

Int 1

Scope

Scope 1+2 (location-based)

% emissions in Scope

94

% reduction from baseline year

15

Metric

Other, please specify (kgCO₂-e/1000 gross tonne kilometre (GTK))

Base year

2015

Start year

2016

Normalized baseline year emissions covered by target (metric tons CO₂e)

0.0086

Target year

2020

Is this a science-based target?

No, and we do not anticipate setting one in the next 2 years

% achieved (emissions)

6

Target status

Underway

Please explain

Aurizon set a 5 year GHG emissions reduction target for its locomotive fleet (diesel & electric) in 2016. The organisation is targeting a 15% reduction in kgCO₂-e/000GTK by 2020, based on a FY2015 baseline.

% change anticipated in absolute Scope 1+2 emissions

0

% change anticipated in absolute Scope 3 emissions

0

C4.2

(C4.2) Provide details of other key climate-related targets not already reported in question C4.1/a/b.

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

C4.3a

(C4.3a) Identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	2	
To be implemented*	7	14446
Implementation commenced*	7	8520
Implemented*	4	9289
Not to be implemented	0	

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Activity type

Energy efficiency: Processes

Description of activity

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

1724

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

670778

Investment required (unit currency – as specified in CC0.4)

7000000

Payback period

4 - 10 years

Estimated lifetime of the initiative

Ongoing

Comment

The roll-out of Driver Advisory System (DAS) technology across Aurizon's locomotive fleet provides optimized custom advice on train handling to the driver contributing to fuel savings and improved train handling where compliance is achieved. More than 200 of Aurizon's locomotive fleet are now fitted with DAS, which has the potential to provide a 4% fuel saving when high compliance to advice is achieved. It should be noted that the annual savings calculation is based on average fuel savings per year, post implementation (and do not reflect additional savings associated with efficient train handling).

Activity type

Energy efficiency: Processes

Description of activity

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

5712

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

1432670

Investment required (unit currency – as specified in CC0.4)

36000000

Payback period

11-15 years

Estimated lifetime of the initiative

Ongoing

Comment

Block 1B - Trip Optimiser (TO) technology provides intelligent cruise control / autopilot capability by learning a train's characteristics, creating an optimal trip profile, then automatically controlling locomotive throttle and dynamic brakes to reduce fuel burn and provide efficient train handling. Aurizon has achieved up to 6% in fuel savings on certain operations with TO fitted to standard gauge locomotives in Western Australia. It should be noted that the annual savings calculation is based on average fuel savings per year, post implementation (and do not reflect additional savings associated with efficient train handling).

Activity type

Energy efficiency: Processes

Description of activity

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

14

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

3350

Investment required (unit currency – as specified in CC0.4)

5000

Payback period

1-3 years

Estimated lifetime of the initiative

Ongoing

Comment

The installation of Fuel Saver Switches across a portion of Aurizon's locomotive fleet provides a manual switch that puts trailing locomotives into Idling mode when traction is not required.

Activity type

Energy efficiency: Processes

Description of activity

Fuel switch

Estimated annual CO2e savings (metric tonnes CO2e)

1735

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

414496

Investment required (unit currency – as specified in CC0.4)

100000

Payback period

1-3 years

Estimated lifetime of the initiative

Ongoing

Comment

Hi-spec diesel has been rolled-out to all of Aurizon's locomotive refuelling facilities sites and represents a world first for Aurizon's primary fuel supplier (global organisation) to directly inject additive at Aurizon's Callemondah facility in Central Queensland (primarily servicing the CQCN). The use of hi-spec diesel removes engine build-up and keeps injectors in optimum working condition preventing degradation in fuel efficiency over-time.

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Compliance with regulatory requirements/standards	Varying methods used to drive investment in emissions reduction activities and the method(s) used are dependent on the type and nature of the particular project / reduction activity.
Employee engagement	Continued roll out of training to locomotive operators, and driver advisory systems to improve fuel efficiency. Energy reduction programs (associated with buildings and facilities) promoted via internal media communications and programs.
Financial optimization calculations	Varying methods used to drive investment in emissions reduction activities and the method(s) used are dependent on the type and nature of the particular project / reduction activity.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.**Level of aggregation**

Company-wide

Description of product/Group of products

By choosing to haul rail freight and bulk commodities between regions, production and export hubs, Aurizon's freight customers can reduce GHG emissions per tonne of freight / product carried by approximately 75%.

Are these low-carbon product(s) or do they enable avoided emissions?

Avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify (Fuel consumption rates per tkm)

% revenue from low carbon product(s) in the reporting year

23

Comment

C5. Emissions methodology

C5.1

(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).

Scope 1

Base year start

January 7 2011

Base year end

March 6 2012

Base year emissions (metric tons CO2e)

676769

Comment

Scope 2 (location-based)

Base year start

January 7 2011

Base year end

March 6 2012

Base year emissions (metric tons CO2e)

455920

Comment

Scope 2 (market-based)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions.

Australia - National Greenhouse and Energy Reporting Act

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Row 1

Gross global Scope 1 emissions (metric tons CO2e)

644134

End-year of reporting period

<Not Applicable>

Comment

As per Aurizon's FY2017 NGER submission.

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We have no operations where we are able to access electricity supplier emission factors or residual emissions factors and are unable to report a Scope 2, market-based figure

Comment

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Row 1

Scope 2, location-based

410064

Scope 2, market-based (if applicable)

<Not Applicable>

End-year of reporting period

<Not Applicable>

Comment

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

No

C6.5

(C6.5) Account for your organization's Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Relevant, calculated

Metric tonnes CO2e

12452.48

Emissions calculation methodology

Emissions associated with office paper consumption calculated on activity data provided from the supplier system. Emissions factors have been derived from the Victorian EPA's 'Greenhouse Gas Emission Factors for Office Copy Paper' bulletin, October 2013. Reams of Carbon Neutral paper purchased during the reporting period were excluded.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Explanation

Capital goods

Evaluation status

Relevant, not yet calculated

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

No process has been implemented to estimate emissions from infrastructure projects that fall outside Aurizon's operational control. Other significant capital investments are in new locomotives and rolling stock.

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status

Relevant, calculated

Metric tonnes CO2e

106110

Emissions calculation methodology

Activity data derived from 2016/17 NGER report. Scope 3 emission factors derived from the National Greenhouse Accounts (NGA) Factors August 2016. Data quality is considered to be high as activity data is derived from a report produced for regulatory compliance that was independently verified.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Explanation

Includes Scope 3 Emissions associated with the extraction, production and transport of fuels consumed. Additionally it includes Scope 3 emissions associated with electricity consumed from the extraction, production and transport of fuel and emissions associated with the electricity lost in transmission and distribution.

Upstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

There were no significant purchases of products that required delivery to Aurizon, as we are a service based organisation, emissions from this source are immaterial.

Waste generated in operations

Evaluation status

Relevant, calculated

Metric tonnes CO2e

4287

Emissions calculation methodology

Activity data derived from corporate waste contractor – and tCO₂-e calculated. Data quality is considered to be high as activity data comes directly from the supplier's reporting system. The disclosed figure does not include emissions from waste removed by other waste contractors.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Explanation

Business travel

Evaluation status

Relevant, calculated

Metric tonnes CO2e

6162

Emissions calculation methodology

5870 tCO₂e is from air travel. This figure is derived from the corporate travel company - FCm Travel Solutions. Carbon emission factors derived from Cleaner Climate. Research sources include DEFRA (Department for Environment Food and Rural Affairs), Oxford University and the UK Royal Commission on Environmental Pollution. Cleaner Climate's coefficient for flight travel is 0.231kg CO₂ released per passenger per km of flight for flights greater than or equal to 3701km, 0.205kg CO₂ released per passenger per km of flight for flights between 1108 and 3700km inclusive. Data quality is considered to be high as activity data comes directly from the supplier's reporting system and calculations are automated. 292 tCO₂e is from car rental. The figure is derive from the corporate car rental providers – Avis, Budget & Hertz. These suppliers use emission factors from www.greenvehicleguide.gov.au. Data quality is considered to be high as activity data comes directly from the supplier's reporting system and calculations are automated. The major limitations are that the disclosed figure does not include emissions from flights booked outside of FCm Travel Solutions and car rentals that were booked outside of Avis, Budget and Hertz (for e.g. business flights paid for using personal credit cards and then reimbursed through expense claims), and business related public transport.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Explanation

Employee commuting

Evaluation status

Relevant, calculated

Metric tonnes CO2e

4561

Emissions calculation methodology

Emissions were calculated based on the Average-data method outlined in the GHG Protocol's Technical Guidance for Calculating Scope 3 Emissions.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

No data collected on employee commuting so the GHG Protocol method is applied to estimations.

Upstream leased assets

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Emissions from leased assets are already included in Scope 2 figures.

Downstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

We do not sell goods – we are service based – so emissions from this source are not relevant.

Processing of sold products

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

We do not sell goods – we are service based – so emissions from this source are not relevant.

Use of sold products

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

We do not sell goods – we are service based – so emissions from this source are not relevant.

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

We do not sell goods – we are service based – so emissions from this source are not relevant.

Downstream leased assets

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

We do not act in the capacity of a lessor.

Franchises

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

We do not operate any franchises

Investments

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

We do not provide financial services or make financial investments.

Other (upstream)

Evaluation status

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Other (downstream)

Evaluation status

Metric tonnes CO2e

Emissions calculation methodology

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

C6.7

(C6.7) Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO₂e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure

0.000031

Metric numerator (Gross global combined Scope 1 and 2 emissions)

1054198

Metric denominator

unit total revenue

Metric denominator: Unit total

3452300000

Scope 2 figure used

Location-based

% change from previous year

3

Direction of change

Decreased

Reason for change

Reduced haulage volumes and emissions reduction activities.

C-TS6.15

(C-TS6.15) What are your primary intensity (activity-based) metrics that are appropriate to your emissions from transport activities in Scope 1, 2, and 3?

Rail

Scopes used for calculation of intensities

Report Scope 1 + 2

Intensity figure

0.000015

Metric numerator: emissions in metric tons CO2e

1054198

Metric denominator: unit

t.km

Metric denominator: unit total

69000000000

% change from previous year

0.2

Please explain any exclusions in your coverage of transport emissions in selected category, and reasons for change in emissions intensity.

Emissions Intensity remained at a similar level to FY2016 due to a combination of factors, including the impacts of Tropical Cyclone (TC) Debbie, and a major third-party derailment on and Aurizon's Central Queensland Coal Network (CQCN). The FY2017 summer period saw record temperatures, resulting in an increased number of temporary speed restrictions which have a negative impact on average emissions intensity reductions.

ALL

Scopes used for calculation of intensities

Please select

Intensity figure

Metric numerator: emissions in metric tons CO2e

Metric denominator: unit

Please select

Metric denominator: unit total

% change from previous year

Please explain any exclusions in your coverage of transport emissions in selected category, and reasons for change in emissions intensity.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization have greenhouse gas emissions other than carbon dioxide?

Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	638347	Other, please specify (NGERTG FY2017 Appendix C)
CH4	958	Other, please specify (NGERTG FY2017 Appendix C)
N2O	4465	Other, please specify (NGERTG FY2017 Appendix C)
SF6	364	Other, please specify (NGERTG FY2017 Appendix C)

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
Australia	644134

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By business division

By activity

C7.3a

(C7.3a) Break down your total gross global Scope 1 emissions by business division.

Business division	Scope 1 emissions (metric ton CO2e)
Aurizon Network Pty Ltd	17890
Interail Australia Pty Ltd	90483
Australian Eastern Railroad Pty Ltd	90017
Aurizon Operations Limited	276265
Australian Western Railroad Pty Ltd	169479

C7.3c

(C7.3c) Break down your total gross global Scope 1 emissions by business activity.

Activity	Scope 1 emissions (metric tons CO2e)
Transport Services	644134

C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO₂e.

	Gross Scope 1 emissions, metric tons CO ₂ e	Net Scope 1 emissions, metric tons CO ₂ e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Electric utility generation activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	620712	<Not Applicable>	The figure provided accounts for Scope 1 emissions associated with locomotive and vehicle operations (excluding stationary emission sources).

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO ₂ e)	Scope 2, market-based (metric tons CO ₂ e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
Australia	410064			

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By business division

By activity

C7.6a

(C7.6a) Break down your total gross global Scope 2 emissions by business division.

Business division	Scope 2, location-based emissions (metric tons CO ₂ e)	Scope 2, market-based emissions (metric tons CO ₂ e)
Aurizon Network Pty Ltd	4315	
Interail Australia Pty Ltd	2269	
Australian Eastern Railroad Pty Ltd	0	
Aurizon Operations Limited	400530	
Australian Western Railroad Pty Ltd	2980	

C7.6c

(C7.6c) Break down your total gross global Scope 2 emissions by business activity.

Activity	Scope 2, location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Transport services activities	410064	

C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7

(C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7) Break down your organization’s total gross global Scope 2 emissions by sector production activity in metric tons CO2e.

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	376569		The figure provided accounts for Scope 2 emissions associated with the operation of electric locomotives (i.e. as the sector production activity).

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Decreased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption		<Not Applicable>		
Other emissions reduction activities	4000	Decreased	0.4	Aurizon's total Scope 1 and 2 emissions were 1091kt CO2e in FY2016. Energy Efficiency initiatives rolled out across our locomotive fleet are estimated to have saved 4ktCO2-e. This represents a decrease of approximately 0.4% ($4/1091 = 0.4\%$).
Divestment		<Not Applicable>		
Acquisitions		<Not Applicable>		
Mergers		<Not Applicable>		
Change in output	28000	Decreased	2.53	Aurizon's total Scope 1 & 2 emission were 1091ktCO2-e in FY2016. In FY2017 reduced haulage volumes resulted in decreased diesel consumption which reduced GHG emissions by approximately 28ktCO2-e ($28/1091 = 2.5\%$). In FY2017, TC Debbie resulted in Aurizon Network declaring a force majeure across the entire CQCN and a (temporary) reduction in rail haulage capacity contributing to an overall reduction in gross scope 1 and 2 emissions.
Change in methodology		<Not Applicable>		
Change in boundary		<Not Applicable>		
Change in physical operating conditions		<Not Applicable>		
Unidentified		<Not Applicable>		
Other		<Not Applicable>		

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 5% but less than or equal to 10%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertakes this energy-related activity
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization’s energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	0	2550217	2550217
Consumption of purchased or acquired electricity	<Not Applicable>		423318	423318
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	64998	<Not Applicable>	64998
Total energy consumption	<Not Applicable>	64998	2973535	3038533

C8.2b

(C8.2b) Select the applications of your organization’s consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	No
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	No

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Fuels (excluding feedstocks)

Acetylene

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

7.8

MWh fuel consumed for the self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Fuels (excluding feedstocks)

Diesel

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

2531988

MWh fuel consumed for the self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Fuels (excluding feedstocks)

Liquefied Petroleum Gas (LPG)

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

585

MWh fuel consumed for the self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Fuels (excluding feedstocks)

Lubricants

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

MWh fuel consumed for the self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Fuels (excluding feedstocks)

Motor Gasoline

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

941

MWh fuel consumed for the self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Fuels (excluding feedstocks)

Natural Gas

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

130

MWh fuel consumed for the self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Fuels (excluding feedstocks)

Other, please specify (Petroleum based oils)

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

16307

MWh fuel consumed for the self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Fuels (excluding feedstocks)

Other, please specify (Ethanol)

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

39

MWh fuel consumed for the self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

C8.2d

(C8.2d) List the average emission factors of the fuels reported in C8.2c.

Acetylene

Emission factor

51.53

Unit

kg CO2e per GJ

Emission factor source

National Greenhouse and Energy Reporting Technical Guidelines (NGERTG) FY2017 – Table 2.3.2A

Comment

Diesel

Emission factor

70.5

Unit

kg CO₂e per GJ

Emission factor source

National Greenhouse and Energy Reporting Technical Guidelines (NGERTG) FY2017 – Table 2.4.2B

Comment

Liquefied Petroleum Gas (LPG)

Emission factor

60.6

Unit

kg CO₂e per GJ

Emission factor source

National Greenhouse and Energy Reporting Technical Guidelines (NGERTG) FY2017 – Table 2.3.2A

Comment

Lubricants

Emission factor

13.9

Unit

kg CO₂e per GJ

Emission factor source

National Greenhouse and Energy Reporting Technical Guidelines (NGERTG) FY2017 – Table 2.4.2A

Comment

Motor Gasoline

Emission factor

69.7

Unit

kg CO₂e per GJ

Emission factor source

National Greenhouse and Energy Reporting Technical Guidelines (NGERTG) FY2017 – Table 2.4.2B

Comment

Natural Gas

Emission factor

51.53

Unit

kg CO₂e per GJ

Emission factor source

National Greenhouse and Energy Reporting Technical Guidelines (NGERTG) FY2017 – Table 2.4.2A

Comment

Other

Emission factor

3.5

Unit

kg CO2e per GJ

Emission factor source

National Greenhouse and Energy Reporting Technical Guidelines (NGERTG) FY2017 – Table 2.4.2A

Comment

Petroleum based greases.

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	64998			
Heat				
Steam				
Cooling				

C8.2f

(C8.2f) Provide details on the electricity, heat, steam and/or cooling amounts that were accounted for at a low-carbon emission factor in the market-based Scope 2 figure reported in C6.3.

Basis for applying a low-carbon emission factor

No purchases or generation of low-carbon electricity, heat, steam or cooling accounted with a low-carbon emission factor

Low-carbon technology type

<Not Applicable>

MWh consumed associated with low-carbon electricity, heat, steam or cooling

<Not Applicable>

Emission factor (in units of metric tons CO2e per MWh)

<Not Applicable>

Comment

C-TS8.2h

(C-TS8.2h) Provide details on the average emission factor used for all transport movements per mode that directly source energy from the grid.

Category	Emission factor unit	Average emission factor: unit value	Comment
Rail	gCO2e/kWh	780	Source: National Greenhouse and Energy Reporting Technical Guidelines (NGERTG) FY2017 – Table 7.2

C-TS8.4

(C-TS8.4) Provide any efficiency metrics that are appropriate for your organization's transport products and/or services.

Activity

Rail

Metric figure

3.11

Metric numerator

Liters of fuel

Metric denominator

Other, please specify (1000 gross tonne kilometre)

Metric numerator: Unit total

220490736

Metric denominator: Unit total

70966618

% change from last year

0.32

Please explain

In 2016 Aurizon set a 5 year GHG emissions intensity target for its locomotive fleet (diesel & electric). The organisation is targeting a 15% reduction in kgCO₂-e/000GTK by 2020, based on an FY2015 baseline. GTK (gross tonne kilometres) represents the movement over a distance of one kilometre of one tonne of vehicle and contents.

Activity

Rail

Metric figure

9.38

Metric numerator

Other, please specify (kWh)

Metric denominator

Other, please specify (1000 gross tonne kilometre)

Metric numerator: Unit total

410936030

Metric denominator: Unit total

43825823

% change from last year

0.54

Please explain

In 2016 Aurizon set a 5 year GHG emissions intensity target for its locomotive fleet (diesel & electric). The organisation is targeting a 15% reduction in kgCO₂-e/000GTK by 2020, based on an FY2015 baseline. GTK (gross tonne kilometres) represents the movement over a distance of one kilometre of one tonne of vehicle and contents.

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

Description

Other, please specify (Locomotive emissions intensity)

Metric value

8.11

Metric numerator

kgCO2-e

Metric denominator (intensity metric only)

1000GTK

% change from previous year

1

Direction of change

Increased

Please explain

Our locomotive greenhouse gas emissions intensity target comprises a 15% reduction by FY2020 from FY2015. Locomotive electric and diesel usage was affected by a significant increase in speed restrictions across our operations over the summer due to recovery from TC Debbie and record high monthly average temperatures. This required more baking activity and reduced ability to conserve momentum for trains descending step grades.

Description

Other, please specify (No. days over 35 Degrees Celcius)

Metric value

Metric numerator

N/A

Metric denominator (intensity metric only)

N/A

% change from previous year

26

Direction of change

Increased

Please explain

Recognising that rail infrastructure is vulnerable to extreme temperatures, Aurizon has invested in real-time data heat monitoring in our CQCN. There have been increasing days of extreme heat in Central Queensland and Aurizon's view is that this trend is likely to continue. For example, Central Queensland experienced record high monthly average temperatures over the 2016/17 summer season.

C-TO9.3/C-TS9.3

(C-TO9.3/C-TS9.3) Provide tracking metrics for the implementation of low-carbon transport technology over the reporting year.

Activity

Rail

Metric

Fleet adoption

Technology

Other, please specify (Energy Miser Technology (DAS))

Metric figure

50

Metric unit

Other, please specify (50% (fleet roll out in FY17))

Explanation

Locomotives fitted with DAS in FY2017, representing ~50% of total fleet. DAS provides advice to drivers to maintain their schedule and minimise fuel and energy use. When compliance to the advice is achieved, it also reduced wear and tear on rollingstock. DAS has the potential to provide a 4% fuel saving when high compliance to the advice is achieved, with services in Europe recording benefit of 10-15%.

Activity

Rail

Metric

Fleet adoption

Technology

Other, please specify (Trip Optimiser)

Metric figure

15

Metric unit

Other, please specify (15% (fleet roll out in FY17))

Explanation

63 locomotives fitted with TO in FY2017, representing ~15% of total fleet. TO provides intelligent cruise control and applies brake and throttle without driver input to optimise fuel efficiency. The technology has resulted in up to 6% fuel saving in specific heavy-haul Western Australian Iron Ore operations.

C-TO9.6/C-TS9.6

(C-TO9.6/C-TS9.6) What is your investment in research and development (R&D), equipment, products and services and which part of it would you consider a direct investment in the low-carbon transition?

Activity

Rail

Investment start date

January 1 2018

Investment end date

January 1 2020

Investment area

Equipment

Technology area

Management

Investment maturity

Full/commercial-scale demonstration

Investment figure

10000000

Low-carbon investment percentage

21-40%

Please explain

The Locomotive Operational Data Acquisition and Management System (LODAM) collects operational and condition data in real-time from locomotives which is analysed against key performance metrics. Aurizon recently installed LODAM on a selection of locomotives in its central queensland coal network (CQCN) operations as part of the trial. The recent trial achieved an 85% reduction in throttle sweeping which minimises waste emissions by allowing tractive effort to catch-up to that of the corresponding notch. Over the course of the 2018/19 financial year period Aurizon plans to roll LODAM out across 200 locomotives in the CQCN and 73 locomotives in the South-East Queensland and New South Wales (NSW) operations. Over 500 channels of information collected from the locomotive fleet will enable a pipeline of Fuel saving initiatives to be executed, focusing on the pipeline of behavioural (culture), compliance and technical initiatives.

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	No third-party verification or assurance

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 and/or Scope 2 emissions and attach the relevant statements.

Scope

Scope 1

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement

2126592-RPT-A_Assurance Audit Statement for Aurizon Holdings Limited 2016-17.pdf

Page/ section reference

Refer to attached statement - page 1.

Relevant standard

Australian National GHG emission regulation (NGER)

Proportion of reported emissions verified (%)

100

Scope

Scope 2 location-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement

2126592-RPT-A_Assurance Audit Statement for Aurizon Holdings Limited 2016-17.pdf

Page/ section reference

Refer to attached statement - page 1.

Relevant standard

Australian National GHG emission regulation (NGER)

Proportion of reported emissions verified (%)

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C8. Energy	Other, please specify (Energy production and consumption)	Australian National GHG emission regulation (NGER) reasonable assurance.	Energy consumption and production data is independently verified to a reasonable assurance level. 2126592-RPT-A_Assurance Audit Statement for Aurizon Holdings Limited 2016-17.pdf

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

Yes

C11.1a

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.

Australia ERF Safeguard Mechanism

C11.1b

(C11.1b) Complete the following table for each of the emissions trading systems in which you participate.

Australia ERF Safeguard Mechanism

% of Scope 1 emissions covered by the ETS

86

Period start date

July 1 2016

Period end date

June 30 2017

Allowances allocated

0

Allowances purchased

0

Verified emissions in metric tons CO₂e

0

Details of ownership

Facilities we own and operate

Comment

Aurizon did not exceed its Safeguard baselines within the reporting year and was not required to purchase, generate or retire Australian Carbon Credit Units (ACCUs).

C11.1d

(C11.1d) What is your strategy for complying with the systems in which you participate or anticipate participating?

Aurizon's fuel and energy consumption is regularly reviewed. Collated fuel and energy data is used to project risk of exposure to an excess emissions scenario. Medium term forecasting is also completed in line with fuel plan and budget (corporate plan) projections.

Aurizon's locomotive emissions intensity target is aligned with fuel and energy reduction initiatives and serves to reduce the likelihood of Aurizon being exposed to an excess emissions scenario. In addition, the organisation applies an internal price on carbon in its business decisions (i.e. mergers, acquisitions etc.) to ensure any potential change to its emissions profile is fully understood.

Aurizon seeks annual independent verification and assurance (reasonable assurance) of its scope 1 and scope 2 greenhouse gas emissions, energy consumption and production data in accordance with the National Greenhouse and Energy Reporting (NGER) Act 2007 determinations and guidelines.

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

No

C11.3

(C11.3) Does your organization use an internal price on carbon?

Yes

C11.3a

(C11.3a) Provide details of how your organization uses an internal price on carbon.

Objective for implementing an internal carbon price

Navigate GHG regulations
Stress test investments

GHG Scope

Scope 1
Scope 2

Application

Aurizon applies an internal price on carbon in relation to major business decisions at different levels depending on the nature of the decision. For example, when considering mergers and acquisitions, carbon pricing may be applied to group, corporate division and business unit levels.

Actual price(s) used (Currency /metric ton)

Variance of price(s) used

Aurizon considers current and long terms demand for emissions reductions under existing and potential policy scenarios, underpinned by government commitments to reduce emissions. It is generally assumed that these commitments will increase overtime as such Aurizon applies an evolutionary pricing approach and assumes that the cost of carbon abatement in Australia will increase in line with international carbon markets.

Type of internal carbon price

Shadow price

Impact & implication

Aurizon uses an internal price on carbon when assessing any significant change the business may potentially undergo, that would impact its emissions profile. Recent examples include a potential acquisition in which the due diligence process included a review of impacts to Aurizon's emissions profile. An internal price on carbon was applied to this calculation to feed into broader analysis and considerations. Aurizon also considers carbon pricing in relation to locomotive fleet purchase and substitution decisions, for example, in relation to Aurizon's electric locomotive fleet, Aurizon considers the cost implications associated with the substitution of electric traction with diesel traction to highlight the implications of domestic energy policy for the competitiveness of Aurizon's electric locomotive fleet which is on average 13% less emissions intensive than the diesel locomotive fleet.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

- Yes, our suppliers
- Yes, our customers
- Yes, other partners in the value chain

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement

Information collection (understanding supplier behavior)

Details of engagement

Other, please specify (Active engagement with suppliers)

% of suppliers by number

3

% total procurement spend (direct and indirect)

10

% Scope 3 emissions as reported in C6.5

79.44

Rationale for the coverage of your engagement

Our supplier engagement focus is aligned with our most material GHG emissions contributor, which is the energy consumption of our locomotive fleet. Aurizon actively engages with our bulk fuel and electricity suppliers on reducing energy consumption and GHG emissions.

Impact of engagement, including measures of success

Aurizon has engaged with fuel suppliers in relation to products that increase fuel efficiency and reduce engine wear and tear. Aurizon has now rolled hi-spec diesel to all of Aurizon's locomotive fuelling locations, resulting in an estimated annual reduction of 1735 metric tons CO2e.

Comment

Aurizon engages with key product suppliers such as, bulk fuel, electricity and vehicle fleet to identify opportunities to reduce energy consumption and emissions. This is primarily achieved through regular meetings with these suppliers that evaluate performance based on agreed metrics.

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement

Education/information sharing

Details of engagement

Run an engagement campaign to education customers about your climate change performance and strategy

Size of engagement

% Scope 3 emissions as reported in C6.5

Please explain the rationale for selecting this group of customers and scope of engagement

Aurizon engages its customers on the advantages achieved from modal shift (i.e. moving from road to rail), such as reducing emissions in the supply chain.

Impact of engagement, including measures of success

For Aurizon customers, customer engagement exercises are undertaken to better understand what drives satisfaction and to identify key areas for improvement. Measures of success are both qualitative (i.e. improved relationships) and quantitative (i.e. reduced emissions in the fleet) and are tailored for each stakeholder. The impact of this engagement is difficult to quantify however, Aurizon continues to advocate the efficiency advantage of rail freight transport which is on average, 75% less emissions intensive than road freight transport. This advocacy occurs through multiple forums and mediums such as, Aurizon's annual sustainability report. For example, in Aurizon's 2017 Sustainability report (p37) Aurizon highlighted the efficiency advantage of electric locomotives which are on average 13% less emissions intensive than diesel locomotives. This aspect was included as part of a broader piece on the increasing cost of using electric locomotives relative to diesel locomotives associated with increasing electricity prices in Australia, and the risk of asset stranding if access pricing is not appropriately adjusted.

C12.1c

(C12.1c) Give details of your climate-related engagement strategy with other partners in the value chain.

Engagements are prioritised based on the outcomes of the organisations materiality assessment. In defining the organisations material priority areas, Aurizon consults broadly with internal and external stakeholders. For example, when preparing Aurizon's 2017 Sustainability report, Aurizon sought to improve the quality of reporting and identified the benefits of external stakeholder feedback with the forming of an external stakeholder advisor workshop. The workshop participants represented a diverse base including customers, non-government organisations, industry groups, financiers, investors and communities. This process helped Aurizon to obtain feedback and demonstrated how valuable stakeholder feedback insights can be in improving Aurizon's sustainability governance on an ongoing basis.

Aurizon notes that for investors, detailed investor presentation briefings are delivered live and are also webcast so they can be viewed by all shareholders.

C12.3

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

Direct engagement with policy makers

Trade associations

Other

C12.3a

(C12.3a) On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Other, please specify (ERF Safeguard Mechanism)	Support with minor exceptions	Aurizon has engaged with policymakers in relation to proposed amendments to the Emissions Reduction Fund (ERF) Safeguard Mechanism. Aurizon's positioning and engagement has involved the attendance of public forums, workshops, direct engagement and through formal submissions.	Aurizon supports climate policy and regulation that up to date and reflective of current business circumstances. Aurizon posits that domestic climate policy and regulatory instruments should incentivise early adopters and adequately accommodate discreet market segments (sub-sector variability) and trade exposed supply chain participants.
Other, please specify (National Energy Guarantee)	Support	Aurizon has engaged with policymakers in relation to proposed amendments to the draft design of the National Energy Guarantee (NEG) through direct engagement with policymakers, and through formal submissions.	Aurizon supports the development of a framework that facilitates an orderly transition of electricity markets consistent with Australia's National Electricity Objective. It is important that the design of the NEG balances the need for investment certainty with change resulting from political cycles. In relation to the emissions requirement under the NEG, Aurizon supports a technology neutral approach that does not promote a certain class of investment or generator(s) at the expense of others. The NEG should also be flexible enough to recognise and incentivise demand side investment. This is of particular relevance to Aurizon's electrified network in Central Queensland (CQCN) wherein there is a risk of fuel switching if emissions obligations materially reduce the competitiveness of electric traction.

C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

Yes

C12.3c

(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

Trade association

Business Council of Australia

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

To provide a stable and predictable environment for investment and business activity, the Australian Government's national energy policy should deliver on the vision of: maximising Australia's competitive advantage in energy through efficient markets; driving growth in our energy resource development and exports; delivering reliable, efficient and competitively priced energy to households and business; realising these growth opportunities while meeting best practice environmental standards and managing Australia's greenhouse gas emissions in line with our 2030 emissions reduction target.

How have you, or are you attempting to, influence the position?

Aurizon has previously engaged with the BCA on climate change and energy policy and regulation, and through input into the preparation of submissions made by the BCA to the Federal Government. Aurizon has brought attention to the additional emissions benefits afforded by using high quality coal with best available technology, and has suggested that policy settings should be technology neutral.

Trade association

World Coal Association

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Low emission technologies exist which can make significant reductions in CO2 emissions from coal use. High efficiency, low emission (HELE) coal technologies and carbon capture and storage (CCS) are critical to meeting energy needs and provide a pathway to limiting global warming by two degrees.

How have you, or are you attempting to, influence the position?

Aurizon has brought attention to the additional emissions benefits afforded by using high quality coal with best available technology.

Trade association

NSW Minerals Council

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Supports the development of a strong and diverse state economy and an effective regulatory framework in which the mining industry can operate profitably and make a meaningful contribution to the state and the people of NSW.

How have you, or are you attempting to, influence the position?

Aurizon engaged with the New South Wales Minerals Council utilising its annual Sustainability Report, particularly in the context of the future of coal and the benefits of Australian coal combined with High Efficiency Low Emissions technology as a mechanism to reduce carbon emissions.

C12.3e

(C12.3e) Provide details of the other engagement activities that you undertake.

Aurizon regularly engages with rail sector participants, including competitors and infrastructure providers in relation to policy positioning and climate risk management. The objectives of these engagements are to encourage discussion about public policy and sector level considerations with particular reference to ensuring the benefits of rail as an energy efficient and less emission intensive form of transportation are communicated, encouraged and reflected in policy settings.

Aurizon is also a member of the Carbon Market Institute (CMI) which enables the organisation to engage with business participants through the Corporate Climate Change Group in relation to strategy, challenges and approaches in managing the climate change agenda.

C12.3f

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

Aurizon has a number of internal processes which are implemented to ensure all of its activities are consistent with its overall climate change strategy. Aurizon has dedicated Stakeholder and Community Engagement, Investor relations and Market Intelligence teams that are responsible for ensuring consistent external positioning. These teams are supported by a number of internal committees that have multi-disciplinary representation and provide review of any potential external policy positions to ensure accuracy and consistency. These include the Environment Community of Competence and Sustainability Committee, which include representatives from Policy & Stakeholder Relations, Enterprise Investor relations, Environment, Market Intelligence and Sustainability. In addition to this, any major policy change or announcement may be referred to the Board for review and approval.

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication

In mainstream reports in accordance with TCFD recommendations

Status

Complete

Attach the document

annual report 2017.pdf

Content elements

Governance

Strategy

Risks & opportunities

Emission targets

Other, please specify (Thermal coal demand)

Publication

In voluntary sustainability report

Status

Complete

Attach the document

aur11177_sustainabilityreport_lr_singlepages.pdf

Content elements

Governance

Strategy

Risks & opportunities

Emissions figures

Emission targets

Other metrics

Other, please specify (Thermal coal demand)

Publication

In voluntary communications

Status

Complete

Attach the document

Aurizon website external link GHG Emissions.pdf

Content elements

Emissions figures

C14. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C14.1

(C14.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Andrew Harding, Managing Director and Chief Executive Officer	Chief Executive Officer (CEO)

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	Public or Non-Public Submission	I am submitting to
I am submitting my response	Public	Investors

Please confirm below

I have read and accept the applicable Terms