TransAlta Corporation - Climate Change 2023

C0. Introduction

C0.1

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

TransAlta Corporation (“TransAlta”) is a Canadian corporation and one of Canada's largest publicly traded power generators with over 111 years of operating experience. We own, operate and manage a geographically diversified portfolio of assets utilizing a broad range of fuels including hydro, wind, solar, natural gas and coal in Canada (4,914 MW, 56 facilities), the United States (1,219 MW, 10 facilities) and Australia (450 MW, 6 facilities). TransAlta will continue to advance our leadership position in renewable electricity through our Clean Electricity Growth Plan, announced in 2021, that includes the following climate-related strategic targets: (i) Deliver 2GW of incremental renewable capacity with a targeted capital investment of $3 billion by the end of 2025; (ii) Accelerate growth in customer-centred renewables and storage through the deployment of our 3 GW development pipeline; (iii) Expand the Company's development pipeline to 5 GW by 2025 to enable a two-fold increase in renewables by 2030; and (iv) Achieve 70 per cent of EBITDA from renewables and storage by the end of 2025. In 2022, we increased our capital target from $3 billion to $3.6 billion to reflect the new input pricing environment. In 2022, our renewable energy gross installed capacity was 2,828 MW and we had over 600 MW of renewable energy under construction. TransAlta is actively transitioning our business to manage climate change risks and opportunities and has demonstrated leadership through action on climate-related issues. The Company no longer generates electricity in Canada using coal. We have retired 4,464 MW of coal-fired generation capacity and converted 1,659 MW of coal-fired facilities to natural gas since 2018. Our remaining coal-fired unit in Washington State is scheduled to retire at the end of 2025.

TransAlta has established 19 short- and long-term sustainability targets in support of the United Nations Sustainable Development Goals ("UN SDGs") and the Future-Fit Business Benchmark and we believe we can make a greater positive impact on UN SDG 7 “Affordable and Clean Energy” and SDG 13 “Climate Action”.

In 2022, we adopted a more stringent climate-related target to achieve net-zero for 100 per cent of TransAlta’s scopes 1 and 2 greenhouse gas ("GHG") emissions by 2045. This new target replaced our previous target to achieve carbon neutrality by 2050. We have also committed to verifying and disclosing 80 per cent of our total scope 3 emissions by 2024. In addition, TransAlta developed our first consolidated Climate Transition Plan, which lays out our approach to reducing operational and value chain emissions to deliver net-zero operations by 2045.

In 2021, TransAlta became the first publicly traded Canadian electricity company to commit to GHG emissions reduction targets through the Science Based Targets initiative ("SBTi"). In 2021, TransAlta approved a more stringent climate-related target to reduce 75 per cent of our scope 1 and 2 GHG emissions by 2026 from a 2015 base year. We estimate that this target is in line with the latest climate science and the electricity sector decarbonization pathway to limit global warming to 1.5°C.

TransAlta uses sustainable or green financing instruments to grow our renewables and storage capacity. Since 2020, we have issued $703 million in green bonds and converted a four-year $1.3 billion revolving credit facility into a sustainability-linked loan that will align the cost of borrowing to TransAlta's GHG emissions reduction and gender diversity targets.

Our 2023+ climate-related targets include:

- By 2026, achieve a 75 per cent reduction of scope 1 and 2 GHG emissions from a 2015 base year;

- By 2045, achieve net-zero for 100 per cent of TransAlta’s scope 1 and 2 GHG emissions;

- By 2024, verify and disclose 80 per cent of TransAlta’s scope 3 emissions;

- No further coal generation by the end of 2025 with 100 per cent of our owned net generation capacity to be from renewables and gas; and

- Develop new renewable projects that support our customers' sustainability goals to achieve both long-term power price affordability and carbon reductions.

On a percentage basis, TransAlta has already achieved emissions reductions beyond the 2030 national targets in our operating jurisdictions and we anticipate further reductions before the end of the decade. In 2022, our GHG emissions (scopes 1 and 2) were estimated to be 10.2 million tonnes as a result of normal operating activities, with a geographic distribution of 51 per cent in Canada, 40 per cent in the United States (“US”) and 9 per cent in Australia. Since 2015, we have reduced GHG emissions by 68 per cent. In 2022, we reduced approximately 2.3 million tonnes of CO_2e or 18 per cent over 2021 levels. Reductions in GHG emissions were primarily due to units being offline during coal-to-gas conversions and coal unit retirements.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data and indicate whether you will be providing emissions data for past reporting years.

Reporting year

Start date
January 1 2022

End date
December 31 2022

Indicate if you are providing emissions data for past reporting years
Yes

Select the number of past reporting years you will be providing Scope 1 emissions data for
2 years

Select the number of past reporting years you will be providing Scope 2 emissions data for
2 years

Select the number of past reporting years you will be providing Scope 3 emissions data for
2 years

C0.3

(C0.3) Select the countries/areas in which you operate.
Australia
Canada
United States of America

C0.4

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

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 chosen approach for consolidating your GHG inventory.
Operational control

C-EU0.7

(C-EU0.7) Which part of the electric utilities value chain does your organization operate in? Select all that apply.

Row 1

Electric utilities value chain
Electricity generation

Other divisions
Battery storage

C0.8

(C0.8) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

Indicate whether you are able to provide a unique identifier for your organization	Provide your unique identifier
Yes, an ISIN code	CA89346D1078
Yes, another unique identifier, please specify (Legal Entity Identifier)	GJZNVO2UY6DNFNIYH321

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) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual or committee	Responsibilities for climate-related issues
Chief Executive Officer (CEO)	TransAlta's President and Chief Executive Officer ("CEO") is a non-independent Director at the Board who maintains the highest level of oversight on climate-related issues at the executive level. Our CEO develops, for the Board's approval, the strategic plan of TransAlta and the business and operational plans to deliver on the approved strategy including climate-related issues. Examples of the CEO's responsibility for climate-related issues include: (i) Implement measures to achieve the Company's reduction of scope 1 and scope 2 GHG emissions by 75 per cent by 2026 from 2015 levels and to continue our path towards net-zero emissions by 2045; (ii) Deliver the Clean Electricity Growth Plan which will bring 70 per cent of EBITDA from renewables and storage by the end of 2025; and (iii) Accelerate the clean energy transition to raise TransAlta corporate profile as a global leader in renewable energy and sustainability. The Board reviews and updates the strategic plan annually during strategic planning sessions, where management provides an assessment of the competitive environment, growth opportunities, regulatory environment and capital allocation to identify opportunities and risks to our business strategy. In 2022, this strategic planning session included climate-related issues associated with growth initiatives and strategies, changes in the regulatory environment and an assessment of the Alberta electricity market (2023 Management Proxy Circular, page 45). As part of the CEO's responsibilities, in 2022 the CEO recommended to the Board the commitment to achieve net-zero for 100 per cent of TransAlta's scope 1 and 2 GHG emissions by 2045 and the development of climate-related financial information including sustainable finance, in alignment with the Task Force on Climate-related Financial Disclosures ("TCFD") recommendations. The Company also committed to verify and disclose 80 per cent of our total scope 3 emissions by 2024. Climate-related issues are material to our business, especially the impact from climate policy. Examples of climate-related decisions made by the CEO and Board in 2022 include: (i) commitment to achieve net-zero emissions by 2045; and (ii) setting climate-related targets to reduce 75 per cent of our scope 1 and 2 GHG emissions by 2026 from a 2015 base year, which we estimate is in line with limiting global warming to 1.5°C.
Board-level committee	The highest level of climate change oversight is at three Board-level committees: our Governance, Safety and Sustainability Committee ("GSSC"), our Audit, Finance and Risk Committee ("AFRC") and our Investment Performance Committee ("IPC"). The GSSC is comprised of independent directors and assists the Board in monitoring and assessing compliance with climate change regulation and reporting, including recommendations to climate-related target setting. Examples of climate-related issues reviewed by the GSSC include management's response to changes in climate change legislation, policy developments and other draft initiatives and the potential impact of such developments to our business. In 2022, the GSSC recommended the approval of a net-zero target for 100 per cent of TransAlta's scope 1 and 2 GHG emissions by 2045, a commitment to verify and disclose 80 per cent of our total scope 3 emissions by 2024, as well as the approval of the annual ESG report including climate-related financial information. The AFRC is comprised of independent directors and assists the Board in overseeing the integrity of our consolidated financial statements and ensures climate risks and opportunities are factored into financial decision-making. Further, the AFRC is responsible for approving our Commodity and Financial Exposure Management policies and reviewing quarterly Enterprise Risk Management ("ERM") reporting. Examples of climate-related issues reviewed by the AFRC include quarterly updates on the Company's risk identification, mitigation and management assessment processes. In 2022, the AFRC reviewed and recommended a US$400 million green bond offering, which included sustainability metrics incorporating the Company's GHG targets. The IPC is comprised of independent directors and assists the Board in overseeing the management's investment conclusions and the execution of major Board-approved capital expenditure projects that are in furtherance of our strategic plans (e.g., clean electricity growth pipeline), including overseeing climate risk assessments and mitigation plans. In 2022, the IPC reviewed and recommended to the Board with respect to acquisition opportunities (e.g., the Horizon Hill wind project), post-investment returns on assets of prior major capital projects (e.g., the Antrim and Big Level wind farms, Windrise wind farms and WindCharger battery storage) and key elements relating to the Company's major capital projects (e.g., the Tempest wind project).

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	Scope of board-level oversight	Please explain
Scheduled – all meetings	Reviewing and guiding annual budgets Overseeing major capital expenditures Overseeing acquisitions, mergers, and divestitures Reviewing innovation/R&D priorities Overseeing and guiding employee incentives Reviewing and guiding strategy Overseeing and guiding the development of a transition plan Monitoring the implementation of a transition plan	<Not Applicable>	TransAlta's Board has delegated to the CEO and senior management the responsibility for the day-to-day leadership and management of the Company. The Board monitors and assesses the performance and progress of the Company's goals through candid and timely reports from the CEO and the senior management team. Nevertheless, the Board takes an active and engaged role in working with senior management and overseeing the strategies, risks, governance and affairs of the Company. Our Board of Directors has group-wide oversight of climate-related issues through the Governance, Safety and Sustainability Committee ("GSSC"), the Audit, Finance and Risk Committee ("AFRC") and the Investment Performance Committee ("IPC"). Meeting quarterly, the GSSC assists the Board in monitoring and assessing compliance with climate change regulation and reporting. The GSSC receives management reports from the Executive Vice President ("EVP"), Legal, Commercial and External Affairs on changes in climate-related legislation and the potential impact of policy developments on TransAlta's operations each quarter. The GSSC then supports the Board in developing Company-wide climate change strategies, policies and practices. The GSSC also reviews environmental protection guidelines, including GHG mitigation and considers whether our environmental procedures are being effectively implemented. The AFRC and IPC also play a role in managing TransAlta's climate-related risks and opportunities. The AFRC assists the Board in overseeing the integrity of our consolidated financial statements and ensures climate risks and opportunities are factored into financial decision-making. Further, the AFRC is responsible for approving our Commodity and Financial Exposure Management policies and reviewing quarterly ERM reporting. The IPC considers and assesses risks related to capital projects, including overseeing climate risk assessments and mitigation plans. As a result, climate-related capital expenditures, acquisitions and budgets are reviewed by the AFRC and IPC on a case-by-case basis.

C1.1d

(C1.1d) Does your organization have at least one board member with competence on climate-related issues?

	Board member(s) have competence on climate-related issues	Criteria used to assess competence of board member(s) on climate-related issues	Primary reason for no board-level competence on climate-related issues	Explain why your organization does not have at least one board member with competence on climate-related issues and any plans to address board-level competence in the future
Row 1	Yes	When recruiting new directors, the GSSC considers the merit of each individual, taking into account the vision and business strategy of the Company, as well as the diversity and skills needed on the Board, the Company's skills matrix, required competencies and the Board and Workforce Diversity Policy. We maintain a skills matrix where each director indicates whether they have expertise and professional background in areas we consider to be essential for TransAlta, having regard to our strategies, plans, operations and stakeholders. The skills matrix is also used by the Board as part of its succession planning process when identifying, selecting and nominating directors for appointment to the Board and as part of evaluating the necessary skills, experiences and qualifications needed to maximize effective decision-making by the Board and its Committees. Given the breadth of experience and skills of each director, the skills matrix lists only the top four competencies possessed by each director nominee based on the Board's assessment and each director's self-evaluation. The Board believes the director nominees possess a diversity of skills and the appropriate mix of competencies needed for the Board to effectively carry out its mandate and oversee the execution of the Company's strategies. The criteria used to assess competence of Board member(s) on climate-related issues includes the knowledge of corporate responsibility practices and the constituents involved in sustainable development practices, including as it pertains to climate change (2023 Management Proxy Circular, page 35).	<Not Applicable>	<Not Applicable>

C1.2

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

Position or committee
Chief Executive Officer (CEO)

Climate-related responsibilities of this position
Managing annual budgets for climate mitigation activities
Managing major capital and/or operational expenditures related to low-carbon products or services (including R&D)
Managing climate-related acquisitions, mergers, and divestitures
Providing climate-related employee incentives
Implementing a climate transition plan
Integrating climate-related issues into the strategy

Coverage of responsibilities
<Not Applicable>

Reporting line
Reports to the board directly

Frequency of reporting to the board on climate-related issues via this reporting line
Quarterly

Please explain
TransAlta's President and CEO maintains the highest level of oversight on climate-related issues at the executive management level. Although the Board is responsible for the stewardship of the Company, it has delegated to the CEO and senior management team the day-to-day leadership and management of the Company. The Board monitors and assesses the performance and progress of the Company's goals through candid and timely reports from the CEO and the senior management team. Our CEO develops, for the Board's approval, the strategic plan for TransAlta, including the business and operational plans to deliver on the approved strategy and climate-related issues. The Board reviews and updates the strategic plan annually during strategic planning sessions, where management provides an assessment of the competitive environment, growth opportunities, regulatory environment and capital allocation in order to identify opportunities and risks to our business strategy. In 2022, this strategic planning session included climate-related issues considering growth initiatives and strategies, changing regulatory environment and an assessment of the Alberta electricity market (2023 Management Proxy Circular, page 45). As part of their responsibilities, in 2022 the CEO sponsored the commitment to achieve net-zero for 100 per cent of TransAlta's scope 1 and 2 GHG emissions by 2045 and the development of climate-related financial information including sustainable finance, in alignment with the Task Force on Climate-related Financial Disclosures ("TCFD") recommendations. The Company also committed to verifying and disclosing 80 per cent of our total scope 3 emissions by 2024. Climate-related issues are material to our business, especially the impact from climate policy. Examples of climate-related decisions made by the CEO and Board in 2022 include: (i) commitment to become net-zero by 2045; (ii) setting climate-related targets to reduce 75 per cent of our scope 1 and 2 GHG emissions by 2026 from a 2015 base year, which we estimate is in line with limiting global warming to 1.5°C; and (iii) increasing our renewable electricity capital target from $3 billion to $3.6 billion to reflect the new input pricing environment.

Position or committee
Other C-Suite Officer, please specify (EVP, Legal, Commercial and External Affairs)

Climate-related responsibilities of this position
Developing a climate transition plan
Setting climate-related corporate targets
Monitoring progress against climate-related corporate targets
Managing public policy engagement that may impact the climate

Coverage of responsibilities
<Not Applicable>

Reporting line
CEO reporting line

Frequency of reporting to the board on climate-related issues via this reporting line
Quarterly

Please explain
At the executive management level, our Executive Vice President ("EVP"), Legal, Commercial and External Affairs provides the Board and CEO with updates on climate-related risks and opportunities to inform business strategy and to ensure alignment with TransAlta's GHG emissions reduction goals. In 2021, the EVP sought and received Executive and Board approval of an enhanced and accelerated near-term emissions target of 75 per cent below 2015 levels by 2026. The EVP provides a quarterly update to the GSSC on climate-related policies that will have an impact on the Company. In 2022, the EVP proposed our first consolidated Climate Transition Plan and the development of climate-related financial information to the Board and received approval to publish in our 2022 Integrated Report (page M79). The EVP also presents recommendations regarding our ESG-related targets. In 2022, the EVP proposed a net-zero target of 100 per cent of TransAlta's scope 1 and 2 GHG emissions by 2045 and a commitment to verifying and disclosing 80 per cent of our total scope 3 emissions by 2024. Finally, the EVP is a member of the Company's Investment Committee, a management committee chaired by our Senior Vice President, M&A, Strategy and Treasurer and comprised of the CEO, EVP, Finance & Trading and Chief Financial Officer. The Investment committee reviews and approves all major capital expenditures including growth, productivity, life extensions and major outages. Projects that are approved by the Investment Committee will then be put forward for approval by the Board, if required.

C1.3

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

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Entitled to incentive
Corporate executive team

Type of incentive
Monetary reward

Incentive(s)
Bonus - % of salary
Shares

Performance indicator(s)
Progress towards a climate-related target
Achievement of a climate-related target

Incentive plan(s) this incentive is linked to
Both Short-Term and Long-Term Incentive Plan

Further details of incentive(s)
TransAlta's executive compensation program is aligned with the Company's focus on being a leading clean electricity Company and is highly performance-based. A strong link between executive compensation and corporate performance is maintained by offering a metric-based Annual Incentive Compensation Plan ("AIC") and a Long-Term Incentive Plan ("LTIP") that includes predominantly Performance Share Units ("PSUs"). One-third of the PSU performance metrics are established based on the achievement of strategic goals for each year in the three-year performance cycle, including specific ESG and climate-related goals. In 2022, we reviewed and refreshed the metrics of our AIC and LTIP to align with our clean energy growth strategy, corporate strategic objectives and shareholder results. Our strategic goals include growing renewable energy, reducing GHG emissions and supporting our customers' sustainability goals to decarbonize through on-site low carbon energy generation.

In 2022, 20 per cent of our AIC scorecard was linked to achieving specific ESG objectives: five per cent related to our equity, diversity and inclusion score, five per cent referred to our organizational culture improvements and 10 per cent was linked to safety. Further, 30 per cent of our AIC scorecard was tied to growth, which is focused on expanding TransAlta's portfolio of renewable generation and will help reduce the Company's overall GHG emissions intensity. In 2022, the growth metric was increased from a 20 per cent to 30 per cent weighting and expanded to include all four growth business unit scorecard metrics that are directly related to achieving our clean electricity growth plan. Our long-term incentive plans include strategic goals related to our focus on clean electricity and strong renewables growth. Further details and highlights of our 2022 executive compensation program results can be found on pages 80 and 85 of our 2023 Management Proxy Circular.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan
Our ESG-linked compensation contributes to the implementation of TransAlta's climate commitments and Climate Transition Plan. In 2022, TransAlta developed its first consolidated Climate Transition Plan, which lays out our approach to reducing operational and value chain emissions to deliver net-zero operations by 2045. In addition, our Climate Transition Plan includes sustainable finance and inclusive transition actions reflecting TransAlta's commitment to a successful transition toward a low-carbon economy. The actions of our Climate Transition Plan align with our climate-related strategic goals to grow renewable energy, reduce GHG emissions and support our customers' sustainability goals to decarbonize through on-site low carbon energy generation. Our executive compensation program is aligned with shareholder interests and financial and strategic performance. In 2022, 30 per cent of our AIC scorecard was tied to growth, which is focused on expanding TransAlta's portfolio of renewable generation and will help reduce the Company's overall GHG emissions intensity. Further details and highlights of our 2022 executive compensation program results can be found on pages 80 and 85 of our 2023 Management Proxy Circular.

Entitled to incentive
All employees

Type of incentive
Monetary reward

Incentive(s)
Bonus - % of salary
Shares

Performance indicator(s)
Progress towards a climate-related target
Achievement of a climate-related target

Incentive plan(s) this incentive is linked to
Both Short-Term and Long-Term Incentive Plan

Further details of incentive(s)
As with the noted executive compensation description, our AIC scorecard employees are also incentivized with the AIC and certain employees are also granted LTIP predominantly comprised of PSUs. Unlike the AIC for TransAlta's executive team, which measures their performance exclusively on corporate performance, the annual incentive targets for employees are measured against both corporate and applicable business unit goals, which includes growth in renewables.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan
The annual incentive targets for employees are measured against both corporate and applicable business unit goals, which includes growth in renewables. In 2022, 30 per cent of our AIC corporate scorecard was tied to growth and expanded to include all four growth business unit scorecard metrics. As a result, a significant component of every employee's compensation can be tied to achieving our strategic goals, which includes growing renewable energy, reducing GHG emissions from our coal-to-gas transition, and supporting our customer sustainability goals to decarbonize through on-site low carbon generation.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?
Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	3	Our Enterprise Risk Management ("ERM") program is designed to help the organization focus its efforts on key enterprise risks and opportunities within the planning horizon of up to 3 years, including climate-related issues that could significantly impact the success of its strategy. As part of the ERM process, annual risk mitigation plans are developed to include near-term actionable steps and longer-term external trends are monitored and reviewed annually as emerging risks.
Medium-term	3	10	Our asset and maintenance plans focus on the medium to long-term. Climate change risks at the asset or business unit level are identified through our Total Safety Management System, asset management function and their processes. All identified material risks are added to our ERM register and scored based on likelihood and impact. We do not consider risks in isolation and major risks are the focus of management response and mitigation plans.
Long-term	10	30	Our asset and maintenance plans focus on the medium to long-term. We run full life cycle forecasts on all our assets. Our long-term planning and risk management of climate change included the completion of a climate-related scenario analysis in 2021 to understand risks and opportunities and assess our strategy's resiliency under two future climate scenarios from the International Energy Agency ("IEA") 2020 World Energy Outlook and the IEA's Net Zero by 2050 ("NZE2050") Roadmap (2022 Integrated Report, page M83). In addition, the Board reviews and updates the Company's long-term strategic plan annually during strategic planning sessions. In 2022 included climate-related issues related to growth initiatives and strategies, the changing regulatory environment and an assessment of the Alberta electricity market (2023 Management Proxy Circular, page 45).

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

i) Description of the process to define 'substantive financial impact': Anything that could incur a substantive 'financial impact', 'strategic impact', 'stakeholder or reputational impact' or 'environment, health and safety impact' to TransAlta and its operations is considered a risk. Risks are assessed based on the impact and likelihood of the risk occurring. The assessment is based on residual risk – after considering processes, controls, initiatives, etc. that are already in place to mitigate the risk. Risks are prioritised through a 5x5 risk matrix, using an impact scale of 1-5, from minimal to massive/extreme and likelihood scale of 1-5 from rare to almost certain. Risk ratings are represented on a risk heat map and ranked as low, moderate or high according to the overall risk rating.

ii) Definition of 'substantive financial impact': A 'substantive financial impact' may occur when a risk has the possible likelihood to materialise and cause a negative impact on TransAlta's earnings.

iii) Description of quantitative indicators and thresholds used to define 'substantive financial impact': Financial impact is measured based on the total financial impact on the Company's earnings before interest, taxes, depreciation and amortization ("EBITDA"), while the potential likelihood of the risk occurring is considered over a five-year period. For the purpose of this CDP response, we quantify 'substantive financial impact' as the result of climate-related risks that could cause a total financial impact on EBITDA of more than $50 million.

iv) Controls in place to monitor risks that could cause 'substantive financial impact': Relevant to climate change, we evaluate risks and opportunities that could impact both operations and finance. For example, we continue to evaluate the long-term impacts of Canada's carbon price to our asset and portfolio plans, as well as federal government incentive programs for renewables, carbon capture and storage, hydrogen and other emerging technologies which may provide out-of-market electricity supply incentives. Prioritized risks are reported to the AFRC quarterly. Moreover, our internal audit team creates an annual audit plan that complements enterprise risk assessments to provide additional assurance to the Board on the effectiveness of programs, projects, systems and controls. Additional financial assurance is provided by TransAlta's Sarbanes–Oxley ("SOX") program which assesses the design, implementation and operation effectiveness of key internal controls over financial reporting under the Sarbanes–Oxley Act in the US.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered
Direct operations
Upstream
Downstream

Risk management process
Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment
More than once a year

Time horizon(s) covered
Short-term
Medium-term
Long-term

Description of process
i) Process for identifying, assessing and responding to climate-related risks and opportunities. Short, medium and long-term climate change risks are identified, monitored and managed through our Enterprise Risk Management ("ERM") processes. To identify, assess and manage climate-related risks and opportunities across our direct operations and value chain (upstream and downstream), the Board relies on the Governance, Safety and Sustainability Committee ("GSSC"), our Audit, Finance and Risk Committee ("AFRC") and our Investment Performance Committee ("IPC"). The GSSC assists the Board in monitoring and assessing compliance with climate change regulation and reporting, including receiving reports and briefings on Management's initiatives with respect to changes in climate change legislation, policy developments as well as assessing the impact of the GHG policies implementation on the Company's business. The AFRC assists the Board in ensuring climate risks and opportunities are factored into financial decision-making. The IPC considers and assesses risks related to capital projects, including overseeing climate risk assessments and mitigation plans. As a result, climate-related capital expenditures, acquisitions and budgets are reviewed by the AFRC and IPC on a case-by-case basis. Climate-related risks and opportunities are also reviewed and assessed in accordance with the TCFD recommendations during the elaboration of the Annual Integrated Report, which is approved by the Board. Finally, the Board reviews and updates its long-term strategic plan annually during strategic planning sessions, which in 2022 included climate-related issues considering growth initiatives and strategies, changing regulatory environment and an assessment of the Alberta electricity market (2023 Management Proxy Circular, page 45). The CEO and executive management review and report on key risks quarterly. At the Management level, the Investment Committee reviews and approves all major capital expenditures including growth, productivity, life extensions and major outages. Projects that are approved by the Investment Committee will then be put forward for approval by the Board, if required. Climate change issues at the asset or business unit level are identified through our Total Safety Management System, asset management function and systems, our energy and trading business, active monitoring, active participation and communication with stakeholders, active participation in working groups, government engagement and more. All identified material risks are added to our ERM risk register. These risks are assessed and scored based on likelihood and impact (which could have 'substantive financial impact', 'strategic impact', 'stakeholder or reputational impact', or 'environment, health and safety impact'). Major risks are the focus of management response and mitigation plans. The business unit and corporate functions work closely together and provide information on risks and opportunities to management, the executive team and the Board. One area that is constantly monitored is climate policy, including the impacts on cost, growth and compliance.

C2.2a

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

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Current environmental and climate specific regulations can and do impact our operations and our business. Both current and emerging regulations are assessed through our Enterprise Risk Management ("ERM"). In the US, for example, state and regional climate and market policies have a significant impact on the pace of energy transition with many governments operating under renewable portfolio standards and carbon pricing regimes. TransAlta operates two thermal generating facilities in the US that could be subject to short-term climate policy changes, but our exposure to this policy risk is low. TransAlta's single coal unit in Washington State is subject to a retirement agreement with the state government that exempts the facility from carbon pricing prior to its end of life in 2025. TransAlta's cogeneration unit at Ada, Michigan operates under a contract that reduces the Company's exposure to policy risk. In addition, our government relations and regulatory teams stay closely connected to current regulations and policy developments in order to stay informed on current challenges and opportunities, while also being prepared for potential changes.
Emerging regulation	Relevant, always included	Environmental and climate specific regulations can and do impact our operations and our business. Both current and emerging regulations are assessed through our ERM. Significant carbon market changes, both provincially and federally in Canada, have been both a current and emerging risk in Canada in the last several years. For example, the escalation in carbon prices and emissions performance regulation may impact TransAlta's natural gas generation fleet in Canada as governments escalate policy stringency to meet 2030, 2035 and 2050 targets. Our management response in 2021 was to develop TransAlta's Clean Electricity Growth Plan. In 2022, our clean and contracted growth reduces the proportional corporate exposure to future policy and regulatory decisions that negatively impact natural gas generation. In addition, TransAlta's policy, regulatory and government relations teams actively engage in official consultation processes, as well as directly with political, department and agency staff. Partnerships are fostered with like-minded industry groups and associations. We continue to advocate for smart policy decisions that achieve emissions reductions, align with our commitment to achieving a 75 per cent GHG emissions reduction over 2015 by 2026, net-zero by 2045 and support our business model (focus on clean, affordable and reliable power for our customers).
Technology	Relevant, always included	Technological changes to support the low-carbon transition present both risks and opportunities for TransAlta. We evaluate existing and emerging impacts of technology through our Energy Innovation team and our ERM process. Examples of technology risks and opportunities include infrastructure changes (such as the shift to distributed energy and away from large-scale power generation infrastructure assets and projects) and digitization combined with greater adoption of energy efficiency (less use of our end product). Cost competitive battery storage will enable greater adoption of renewables and a shift to a distributed power generation model. We continue to evaluate both short and long duration battery and other forms of storage for its financial viability, while monitoring the potential impact battery technology could have on natural gas power generation. In 2020, we completed our first battery storage (10 MW) project at one of our wind facilities in southern Alberta. In 2021, we agreed to deliver a hybrid system of solar with battery storage facility (48 MW) in Western Australia. We continue to investigate the possibility of battery storage at our other facility locations. Our teams continuously adopt improved technology at each of our new developments, which helps protect our shareholder value and maintain reliable and affordable electricity delivery. We are well-positioned to take advantage of technological opportunities in storage through hydro and/or battery power. We are also well-positioned to take advantage of advancements in renewable technologies as we build new facilities. We are actively accelerating our renewable growth strategy, with $3.6 billion in investment and 2 GW of growth planned by 2025. We will continue monitoring new technologies such as storage, hydrogen and carbon capture, utilisation and storage ("CCUS") for future deployment.
Legal	Relevant, always included	The risk and liability associated with climate change, specific to, for example: regulatory compliance, disclosure, mitigation, adaption, failure to adapt operations or investment decisions are increasingly being evaluated through our ERM process. We are mature in areas such as disclosure and regulatory liability risk. We have noted the trends in increased climate litigation for some time and have mitigated potential risk through alignment of our strategy with global decarbonization goals and we have increased our transparency on climate risks and opportunities by enhancing our disclosure. For example, we have reported to this CDP climate change disclosure request for over 10 years, we have aligned climate disclosure with the Task Force on Climate-related Finance Disclosures ("TCFD") recommendations in our annual integrated report for six years, we have established a voluntary GHG reduction target to 2026 and we have established a voluntary net-zero target for 2045.
Market	Relevant, always included	Our major market risks are associated with our coal and natural gas assets. Increased costs for natural gas supply due, in part, to carbon pricing changes could impact our operating costs. We actively monitor market risks through our energy marketing and asset optimization teams and our ERM process. We managed the market risks to our coal assets by converting some to natural gas and plan to fully transition off coal by 2025. Further, our corporate functions apply regionally specific carbon pricing, both current and anticipated, as a mechanism to manage future risks of uncertainty in the carbon market. To simultaneously manage our risks and leverage market opportunities, we continue operating our hydro, wind and solar facilities and are investing in expanding our renewable energy fleet. We currently have over 20 renewable projects that are either under construction or in the development stage. We are committed to growing our clean energy fleet and, since 2019, have added over 400 MW of renewables and storage, including utility-scale battery storage. Further, we established organized Canadian, US and Australian clean energy growth teams. In 2022, the Company announced 200 MW of new build renewable projects. TransAlta has established a pipeline of potential growth projects that includes 374 MW of advanced stage development projects along with 3,891 to 4,991 MW of projects in earlier stages of development. Our renewable fleet makes our overall portfolio more resilient to climate risk, provides increased flexibility in generation and creates incremental environmental value through environmental attributes. Lastly, we recognize the opportunity to grow our ancillary services, such as systems support, providing flexibility to the decarbonizing grid.
Reputation	Relevant, always included	Negative reputational impacts, including revenue loss and a reduced customer base, are evaluated through our ERM process. In the past, we experienced negative reputational impacts due to our coal operations, including a negative impact on the market price of our common shares. Our transition away from coal mitigates this reputational risk. In 2021, we achieved the full phase-out of coal-fired generation in Canada. This means TransAlta's thermal facilities in Canada have been decommissioned or fully transitioned to a 100 per cent natural gas operation. In addition, at the end of 2021 the Highvale coal mine was closed. In the US, Centralia Unit 1 retired on Dec. 31, 2020 and the remaining Centralia unit is set to retire on Dec. 31, 2025, per an agreement with the State of Washington. As consumer trends move in favour of renewable and clean electricity, we are investing in a diversified mix of renewable generation and optimizing our natural gas fleet. We continue to actively monitor and manage reputational risks by delivering renewable power solutions while maintaining competitive costs and reliability.
Acute physical	Relevant, always included	Climate-related acute and chronic physical risks and opportunities are assessed through our ERM with support from business units and subject matter experts. We have operating assets in three countries and varied geographic locations, many of which could be impacted by extreme weather events. We are thus continuously evaluating the potential impact of acute climate change on our business. Our facilities, construction projects and operations are exposed to potential interruption or loss from environmental disasters (e.g., floods, strong winds, wildfires, ice storms, earthquakes, tornados, cyclones). A significant climate change event could disrupt our ability to produce or sell power for an extended period. Therefore, we strive to mitigate future impacts with climate adaptation solutions. For example, our gas facility at South Hedland, Australia, is built with climate adaptation in mind. We designed the facility to withstand a category 5 cyclone (the highest cyclone rating). We have mitigated the risk of floods that can occur in the area by constructing the facility above normal flood levels. In 2019, a category 4 cyclone hit this facility but did not impact operations. We were able to continue generating electricity through the storm despite widespread flooding and the shutdown of the nearby port. In Canada, as we near the 10-year anniversary of the 2013 floods in Southern Alberta, we continue to implement projects that increase the resilience of our hydro facilities to severe climate events. We have also modified operations at several of our facilities as per an agreement with the Government of Alberta. This reduces flood risk in the spring while also recognizing the potential for increased droughts as a result of climate change in the future. TransAlta continues to participate in multi-stakeholder groups developing options for climate resiliency across Southern Alberta.
Chronic physical	Relevant, always included	Climate change related acute and chronic physical risks and opportunities are assessed through our ERM with support from business units and subject matter experts. We continuously investigate the physical impacts of chronic climate change on our operating assets and actively integrate climate modelling into our long-term planning. For example, changes to water flow or wind patterns could impact our hydro and wind businesses and associated revenue generation.

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?
Upstream

Risk type & Primary climate-related risk driver

Current regulation	Carbon pricing mechanisms

Primary potential financial impact
Increased direct costs

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
Carbon price increases the cost of our natural gas operations. TransAlta's 2021 climate scenario analysis results have shown that additional mandated emission reductions could force our remaining plants to invest in technologies like CCUS, thus increasing the operating costs for natural gas plants. At this time, natural gas assets in the US and Australia face less risk compared to assets in Canada. In the US, TransAlta operates two thermal generating facilities that could be subject to short-term climate policy changes, but our exposure to this policy risk is low. TransAlta's single coal unit in Washington State is subject to a retirement agreement with the state government that exempts the facility from any future carbon policy obligations prior to its end of life in 2025. TransAlta's cogeneration unit at Ada, Michigan, operates under a contract that reduces the Company's exposure to policy risk. In Australia, our natural gas assets may face reduced policy risk related to changes in government policies as our assets are predominantly contracted and serve remote industrial load. Escalation in carbon prices and emissions performance regulation may impact TransAlta's natural gas generation fleet in Canada as governments escalate policy stringency to meet 2030, 2035 and 2050 targets. Our Alberta natural gas fleet is composed of six facilities with a total of 2,407 MW, which represents 67 per cent of our global gas capacity and has experienced significant increased operating costs due to carbon pricing increases from $40/tonne CO2e in 2021 to $50/tonne CO2e in 2022 and $65/tonne CO2e in 2023.

Time horizon
Short-term

Likelihood
Virtually certain

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
Yes, an estimated range

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
38000000

Potential financial impact figure – maximum (currency)
44000000

Explanation of financial impact figure
The potential financial impact figures are calculated considering the carbon compliance cost of exposed natural gas facilities and assuming an operation control basis. Of the total six facilities, we excluded two facilities that are accounted under our scope 3 GHG emissions (Poplar Creek and Sheerness) and one that is a cogeneration facility (Fort Saskatchewan) not currently exposed to climate-related regulatory risk under the Alberta's Technology Innovation and Emissions Reduction Regulation ("TIER"). Therefore, the risk exposure to our natural gas assets affects only three facilities (Keephills Unit 2, Keephills Unit 3 and Sundance Unit 6), which were converted from coal to natural gas in 2021. Carbon costs in Alberta were $50/tonne CO2e in 2022 as per Canadian federal rules. Starting in 2023, carbon pricing is $65/tonne CO2e and is expected to increase by $15 annually until 2030 with a $170/tonne price. The time horizon used to calculate the potential financial impact figures is 2026, in alignment with our target of 75 per cent GHG emissions reductions by 2026. We estimate that this target is in line with the latest climate science and the electricity sector decarbonization pathway to limit global warming to 1.5°C and meet the Paris Agreement goals. The maximum potential financial impact is calculated for 2023 using a minimum carbon cost of $65/tonne CO2e, which equates to approximately $44 million. The minimum potential financial impact is calculated for 2026 based on the maximum carbon compliance cost of $110//tonne CO2e, which equates to approximately $38 million. We used a performance standard of 0.36267 tonnes CO2e per MWh for 2023 and 0.3404 tonnes CO2e per MWh for 2026 as per the Alberta TIER performance standard, taking the difference between the facility emission intensity and the performance standard and multiplying by the carbon price. This assumes the plants operate in natural gas and not coal.

Cost of response to risk
3600000000

Description of response and explanation of cost calculation
i) Description of response: Case Study. Situation: TransAlta's 2021 climate scenario analysis results have shown that escalation in carbon prices and emissions performance regulation may impact TransAlta's coal and natural gas generation fleet as governments escalate policy stringency. Action: In response to this risk, in 2021, we completed our conversion of existing Canadian coal assets to natural gas, achieving our goal of transitioning off coal in Canada. In 2025, we will also retire our single remaining coal unit, located in the US, to complete TransAlta's transition away from coal generation. Our coal-to-gas facilities fit well within government plans to continue providing reliable and competitively priced electricity for consumers and industry. In 2021, we also announced our Clean Electricity Growth Plan which will see the Company execute on 2 GW of renewables growth by 2025. Result: The plan will reduce the proportional Company exposure to potential policy and regulatory decisions that negatively impact natural gas generation. Our remaining natural gas facilities operate under contract, reducing TransAlta's exposure to changes in carbon pricing.

ii) Explanation of cost calculation: TransAlta's Clean Electricity Growth Plan has a targeted capital investment of $3.6 billion by the end of 2025. In 2022, we increased our capital target from $3 billion to $3.6 billion to reflect the new input pricing environment. The plan will largely be funded from current cash balances, cash generated from operations and asset-level financing. Once fully operational, the new assets are targeted to deliver incremental average annual EBITDA of $315 million.

Comment
No further information.

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?
Downstream

Opportunity type
Products and services

Primary climate-related opportunity driver
Development and/or expansion of low emission goods and services

Primary potential financial impact
Increased revenues resulting from increased production capacity

Company-specific description
The results of TransAlta's 2021 climate-related scenario analysis, aligning with a 1.5°C world, have shown that opportunities to grow the renewable fleet exist across all scenarios and locations which in turn will increase our revenues. Renewable assets (hydro, wind and solar) are expected to become the default form of generation with demand for power from these types of assets increasing. The decreasing cost of renewables also facilitates the growth of a renewable fleet, especially under the International Energy Agency's Net Zero by 2050 ("NZE2050") and Sustainable Development ("SDS") scenarios. Our renewable energy commitment began 111 years ago when we built the first hydro assets in Alberta, which still operate today. In 1997, we began operating our first wind facility, in 2014, our first solar facility and, in 2020, our first battery storage facility. Today, we operate over 50 renewable facilities across Canada, the US and Australia. We are proud to be one of the largest producers of wind power in Canada and the largest producer of hydro power in Alberta — we have grown our nameplate renewable energy capacity from approximately 900 MW in 2000 to over 2,900 MW in 2022. As a leader in North American renewable electricity, we are well-positioned to build renewable energy facilities and hybrid facilities to support customer decarbonization goals.

Time horizon
Short-term

Likelihood
Virtually certain

Magnitude of impact
Medium-high

Are you able to provide a potential financial impact figure?
Yes, an estimated range

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
123600000

Potential financial impact figure – maximum (currency)
134600000

Explanation of financial impact figure
TransAlta's Clean Electricity Growth Plan will deliver 2 GW of incremental renewable capacity with a targeted capital investment of $3.6 billion by the end of 2025. These new assets, once fully operational are targeted to deliver incremental average annual EBITDA of $315 million. As part of our Clean Electricity Growth Plan, this Company-specific opportunity is expected to create an average annual EBITDA of $123.6 million to $134.6 million for TransAlta and support GHG reduction goals for customers. To quantify the financial impact figure, we used the estimated average annual EBITDA for each wind and solar project under construction in 2022, which includes minimum and maximum expected figures: White Rock wind projects $62-68 million (US$48-52 million), Garden Plain wind project $14-15 million, Horizon Hill wind project $39-43 million (US$30-33 million) and Northern Goldfields solar project $8-9 million (AU$9-10 million). The figures are forward-looking; they are not defined and have no standardized meaning under IFRS. For detailed information on the figures used, refer to our 2022 Integrated Report, page M61.

Cost to realize opportunity
1284000000

Strategy to realize opportunity and explanation of cost calculation
i) Strategy to realize opportunity: Case Study. Situation: Our strategy to realize this opportunity and increase our revenues from growing the renewable fleet involves achieving a 100 per cent mix of renewables and natural gas. Action: In 2021, as part of our Clean Electricity Growth Plan we set the goal to achieve 70 per cent EBITDA from renewables and storage by the end of 2025. In 2022, TransAlta announced 374 MW of advanced-stage development projects along with 3,891 MW to 4,991 MW of projects in earlier stages of development.

Results: Examples of 2022-2023 wind and solar developments (total of 678 MW) under construction in 2022/2023 include White Rock, wind (300 MW, US), Garden Plain, wind (130 MW, Canada), Horizon Hill, wind (200 MW, US) and Northern Goldfields, solar with battery storage (48 MW, Australia). We continue to develop renewable energy facilities to support customers achieving their sustainability goals and targets, such as 100 per cent renewable power targets and/or GHG reduction targets. Production from renewable electricity in 2022 resulted in the avoidance of approximately 2.7 million tonnes of CO_2e for our customers.

ii) Examples of how our renewable energy projects benefit customers: our Garden Plain wind project in Alberta is subject to a power purchase agreement ("PPA") with Pembina and an investment-grade customer, our White Rock wind projects in Oklahoma is subject to a PPA with Amazon, our Horizon Hill wind project is subject to a long-term PPA with Meta and our Northern Goldfields solar project with a battery energy storage system in Western Australia is subject to a PPA with BHP Billiton.

iii) Explanation of cost calculation: Total cost is estimated at approximately $1.284 billion, assuming the middle range cost estimates for each project: White Rock, wind - $625 million, Garden Plain, wind - $195 million, Horizon Hill, wind - $400 million and Northern Goldfields, solar - $64 million. For detailed information on the figures used, refer to our 2022 Integrated Report, page M61.

Comment
No further information.

C3. Business Strategy

C3.1

(C3.1) Does your organization's strategy include a climate transition plan that aligns with a 1.5°C world?

Row 1

Climate transition plan

Yes, we have a climate transition plan which aligns with a 1.5°C world

Publicly available climate transition plan

Yes

Mechanism by which feedback is collected from shareholders on your climate transition plan

We have a different feedback mechanism in place

Description of feedback mechanism

TransAlta consistently communicates our corporate strategy to our shareholders, which includes our Climate Transition Plan. The Company's past achievements and future strategy are presented to shareholders by our CEO each year during the annual general meeting. Like any strategic decision the Company makes, the shareholders can voice their support by approving (or withholding votes for) the election of directors (including our CEO).

Additionally, annually we deliver several planned and ad-hoc engagements with investors regarding our low-carbon transition plan. Examples of planned engagements include investor presentations, quarterly results calls, investor days and investor conferences. Prior to each quarterly results calls, we reach out to investors and provide them the opportunity to engage with investors on topics, including climate change and our Climate Transition Plan. We also respond to their shareholder feedback on our decarbonization strategy on an ad-hoc basis. Examples of TransAlta's Climate Transition Plan discussed during our most recent Q1 2023 Results include: - Updates on TransAlta's Clean Electricity Growth Plan execution, - Progress towards net-zero by 2045 and - Accelerate CO2 emissions reduction to 75% from 2015 levels by 2026 (Slides 14-19).

During investor conferences, we organize one-on-one engagements between investors and our executive team on sustainability and climate change issues. Specifically, during our November 2022 Investor Presentation, our CEO and our EVP, Legal, Commercial and External Affairs presented our 2021-2030 investment focus on renewables, storage and new technologies to decarbonize our operations (Slides 8-10 and 27). Other communication tools to engage on our decarbonization journey include ah-hoc and quarterly press releases such as on February 22, 2023 "TransAlta Reports Fourth Quarter and Full Year 2022 Results and Commits to Net-Zero by 2045".

Frequency of feedback collection

More frequently than annually

Attach any relevant documents which detail your climate transition plan (optional)

Attached is the presentation deck shared at TransAlta Corporation's Q1 2023 Results on May 5, 2023.
Q1-2023-Results-Presentation-Final-1.pdf

Explain why your organization does not have a climate transition plan that aligns with a 1.5°C world and any plans to develop one in the future

<Not Applicable>

Explain why climate-related risks and opportunities have not influenced your strategy

<Not Applicable>

C3.2

(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?

	Use of climate-related scenario analysis to inform strategy	Primary reason why your organization does not use climate-related scenario analysis to inform its strategy	Explain why your organization does not use climate-related scenario analysis to inform its strategy and any plans to use it in the future
Row 1	Yes, qualitative and quantitative	<Not Applicable>	<Not Applicable>

C3.2a

(C3.2a) Provide details of your organization's use of climate-related scenario analysis.

Climate-related scenario	Scenario analysis coverage	Temperature alignment of scenario	Parameters, assumptions, analytical choices
Transition scenarios: IEA STEPS (previously IEA NPS)	Company-wide	<Not Applicable>	In STEPS, the energy system has no major additional climate and environmental policies enacted by government(s). STEPS assumes that carbon pricing continues in Canada while no carbon price is set in the US or Australia. STEPS also assumes that the power sector reduces emissions by 45 per cent by 2040 while natural gas generation capacity increases. Finally, STEPS is limited to the deployment of commercial-ready technologies, including wind and solar. The IEA models make assumptions about technology, energy policy, CO2 prices, fuel prices, energy use, resources, markets and various societal, political and economic drivers such as population and GDP. No changes were made to the inputs or assumptions in the scenarios. The climate scenarios analysis considered TransAlta's 2020 EBITDA, business segments, installed capacity and generation as baseline data for scenario 2020-2040. Electricity pricing assumptions were not made as part of this analysis.
Transition scenarios: IEA SDS	Company-wide	<Not Applicable>	In SDS, the goals of the Paris Agreement (2015) are achieved, resulting in net-zero emissions by 2070. The SDS assumes a rapid increase in clean energy policies and investments that position the energy system to also achieve key UN SDGs. In SDS, all current net-zero pledges are achieved and there are extensive efforts to reduce emissions. SDS assumes that carbon pricing continues in Canada and is set in the US and Australia. It also assumes that the power sector reduces emissions by 90 per cent by 2040 while natural gas capacity remains stable into 2030 and declines toward 2040. Finally, SDS assumes that beyond wind and solar, the energy system relies on batteries, storage and some level of carbon capture, utilization and storage ("CCUS") and hydrogen. The IEA models make assumptions about technology, energy policy, CO2 prices, fuel prices, energy use, resources, markets and various societal, political and economic drivers such as population and GDP. No changes were made to the inputs or assumptions in the scenarios. The climate scenarios analysis considered TransAlta's 2020 EBITDA, business segments, installed capacity and generation as baseline data for scenario 2020-2040. Electricity pricing assumptions were not made as part of this analysis.
Transition scenarios: IEA NZE 2050	Company-wide	<Not Applicable>	IEA Net Zero by 2050 ("NZE2050") represents a pathway for the global energy sector to achieve net-zero emissions by 2050. This scenario also assumes key energy-related SDGs are achieved through universal energy access by 2030 and major improvements in air quality. NZE2050 is built upon the idea that a global increase in electrification supports the journey to net-zero. It assumes that an aggressive carbon price is set in Canada, the US and Australia. It also assumes the power sector reaches net-zero emissions by 2035 in advanced economies while natural gas capacity is stable to 2030 and declines significantly into 2040. Like the SDS, NZE2050 assumes that beyond wind and solar, the energy system relies on batteries, storage and some level of CCUS and hydrogen. The IEA models make assumptions about technology, energy policy, CO2 prices, fuel prices, energy use, resources, markets and various societal, political and economic drivers such as population and GDP. No changes were made to the inputs or assumptions in the scenarios. The climate scenarios analysis considered TransAlta's 2020 EBITDA, business segments, installed capacity and generation as baseline data for scenario 2020-2040. Electricity pricing assumptions were not made as part of this analysis.
Physical climate scenarios: RCP 8.5	Company-wide	<Not Applicable>	The IPCC's RCP 8.5 (previously SSP5 8.5) climate change scenario was adopted to assess the physical risks associated with our renewable assets in Canada, the US and Australia. The RCP 8.5 represents the high end of the range of future pathways and was selected for this reason, assuming a business-as-usual path consistent with the current pace of global emissions. The RCP 8.5 pathway delivers a temperature increase of about 4.3˚C by 2100, relative to pre-industrial temperatures. The model CMIP6 was chosen based on geographical completeness. The baseline used was 1995-2014 for a near-term period of 2021-2040. We assessed quantitative and qualitative variables such as maximum temperature, minimum temperature, total precipitation, snowfall, surface wind, sea level rise and surface water flow.

C3.2b

(C3.2b) Provide details of the focal questions your organization seeks to address by using climate-related scenario analysis, and summarize the results with respect to these questions.

Row 1

Focal questions

In 2021, TransAlta conducted a climate scenario analysis to understand risks and opportunities and assess our strategy's resiliency under several future climate scenarios. The analysis utilized scenarios from the International Energy Agency's ("IEA") 2020 World Energy Outlook, a large-scale simulation model designed to replicate how energy market's function. We used three scenarios, Stated Policies ("STEPS"), Sustainable Development ("SDS") and Net Zero by 2050 ("NZE2050"). In 2022, we reviewed the findings from the climate scenario analysis and updated the management response accordingly. Detailed information starts on page M83 of our 2022 Integrated Report. Focal questions to be addressed using climate-related scenario analysis: (i) What are the risks associated with our natural gas assets? (ii) What are the opportunities associated with our business strategy to grow our renewables fleet (hydro, solar, wind)?

Results of the climate-related scenario analysis with respect to the focal questions

i) Focal question 1 - What are the risks associated with our natural gas assets? Case study. Situation: Under the NZE2050 scenario we anticipated higher operational costs driven by an increase in carbon price to US$205/tonne CO2e by 2040 in all our operating regions and lower operational capacity is expected to impact the profits from our natural gas assets. Task: Decarbonizing the electricity sector is a key pillar of global climate efforts. Hence, we must continually raise our level of ambition as we did in early 2021 by setting our carbon neutrality target for 2050. Action: In 2021, TransAlta adopted a more stringent target to reduce 75 per cent of our scope 1 and 2 GHG emissions by 2026 from a 2015 base year (32,227,815 tonnes CO2e). We estimate that this is in line with limiting global warming to 1.5°C. We also committed to pursuing the validation of this new target through the Science Based Targets initiative and used their Sectoral Decarbonization Approach methodology. This approach aligns us with the Paris Agreement and UN SDG 13 on climate action. In addition, in 2022 we adopted a more ambitious target to be net-zero by 2045. Results: We became the first publicly traded Canadian energy company to commit to setting a science-based emissions target. This step is critical in ensuring that our actions are aligned with the steps required to achieve global climate goals in line with a 1.5°C pathway.

ii) Focal question 2 - What are the opportunities associated with our business strategy to grow our renewables fleet? Case study. Situation: Our strategy is focused on the development of renewable energy, storage and low-carbon natural gas generation. From 2000 to 2022, we grew our nameplate renewables capacity from approximately 900 MW to over 2,900 MW. Task: A growth of renewable electricity generation of approximately 950 per cent is expected by 2040 compared to 2019 levels. This results in renewables comprising more than 85 per cent of the electricity generation in the regions we operate. The transition of hydro to baseload capacity is expected to create upside for TransAlta. An increase in TransAlta's renewable capacity and demand are expected to enable growth and higher revenues. Action: Based on the scenario analysis, TransAlta assessed the acceleration of our business strategy to grow our renewables and in 2021 we announced our Clean Electricity Growth Plan which will see the company execute on 2 GW of renewables growth by 2025. Results: By the end of 2025, we expect 70 per cent of our EBITDA to be derived from renewables. To help combat the challenges of renewable energy intermittency, we continue to invest in new technology development such as battery storage.

C3.3

(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	i) Description of how our strategy for products and services has been influenced by climate-related risks and opportunities: Over the past decade, TransAlta has been shifting from providing a GHG-intensive product to a low-carbon product to meet the need to decarbonize and mitigate associated societal risks, as well as the changing goals of our customers. ii) Case study. Situation: From 2000 to 2022, we grew our nameplate renewable capacity from approximately 900 MW to over 2,900 MW. Based on our climate 2021 scenario analysis, an increase in TransAlta's renewable capacity and demand are expected to enable growth and higher revenues. Task: Since 2018, TransAlta has maintained the target to provide "No further coal generation by the end of 2025 with 100 per cent of our owned net generation capacity to be from renewables and gas" (see case study for Operations) and in 2021 we decided to assess how to accelerate our business strategy to grow our global renewables fleet. Action: In 2021, we announced our Clean Electricity Growth Plan which will see the company execute on 2 GW of renewables growth by 2025. By the end of 2025, we expect 70 per cent of our EBITDA to be derived from renewables. Results: The evolution of our decarbonization targets – from phasing out coal to expanding renewable electricity generation – has shaped our company to become a leader in clean energy in North America. Our investments demonstrate our commitment to a cleaner future and we are on track to deliver a two-fold increase in renewable assets by 2030.
Supply chain and/or value chain	Yes	i) Description of how our strategy for supply chain and value chain has been influenced by climate-related risks and opportunities: Our customer base is increasingly integrating ESG risk into their business decisions and as such, we see an advantage in continued growth in clean power technologies to support our customer sustainability goals, such as RE100 or net-zero ambitions. ii) Case study. Situation: International research confirms that reducing global carbon dioxide emissions to net-zero by 2050 is consistent with efforts to limit the long-term increase in average global temperatures to 1.5˚C. Task: In 2020 we set ourselves the task to "Develop new renewable projects that support customer sustainability goals to achieve both long-term power price affordability and carbon reductions". In addition, we rolled out a Supplier Relationship and Performance Management program with our key strategic suppliers. The goals of the program include ensuring alignment of our suppliers' goals with those of TransAlta, streamlining communications while providing a platform to discuss how to elevate performance, creating value though access to innovative ideas and working closely with the suppliers on executing activities. Action: In 2021, TransAlta accelerated its climate-related target and adopted a more stringent target to reduce 75 per cent of our scope 1 and 2 GHG emissions by 2026 from a 2015 base year (32,227,815 tonnes CO2e). We estimate that this target is in line with the latest climate science and the electricity sector decarbonization pathway to limit global warming to 1.5°C and meet the Paris Agreement goals. In addition, we revised our Supplier Code of Conduct that applies to all vendors and suppliers of TransAlta. Under this code, suppliers of goods and services to TransAlta are required to adhere to our core values, including as they pertain to health and safety, ethical business conduct and environmental leadership. Climate change management cuts across all three of these values for suppliers. Results: We are very proud of our emissions track record to date. In 2022, our Company achieved a 31.7 million tonne GHG emission reduction from 2005 levels. On a percentage basis, this reduction already exceeds the 2030 national emissions targets in Canada, the US and Australia where we operate.
Investment in R&D	Yes	i) Description of how our strategy for investment in R&D has been influenced by climate-related risks and opportunities: Increased revenues through access to new and emerging markets present an opportunity that is expected to enable growth and higher revenues under a net-zero economy. Our scenario analysis showed that more than 85 per cent of electricity in areas we operate will be made up of renewables by 2040. Storage capacity is expected to grow to approximately 250 GW in the US. ii) Case study. Situation: We recognize the need to decarbonize the power sector and we are taking strategic steps to support this work with increased renewable energy and conversion of coal assets to gas-fired generation. We also recognize the problems associated with renewable energy intermittency. Task: To leverage this opportunity and combat the challenges of renewable energy intermittency, we continue to invest in battery storage. Since 2020, we have maintained our sustainability goal to "Develop new renewable projects that support customer sustainability goals to achieve both long-term power price affordability and carbon reductions". Action: In 2020, we launched WindCharger, a "first of its kind in Alberta" battery storage project (10 MW/20 MWh) that uses Tesla lithium-ion batteries. This project stores energy produced by our Summerview II wind facility and uses that energy to provide ancillary services including fast frequency response service and to shift generation production to supply shortage periods. This project received co-funding support from Emissions Reduction Alberta and the total cost to TransAlta was $7-$8 million. In 2021, we agreed to provide renewable solar electricity supported with a battery energy storage system to BHP through the construction of the Northern Goldfields solar project in Australia. This project will support BHP in meeting its emissions reduction targets and delivering lower carbon, sustainable nickel to its customers. In 2021, we also established a new Energy Innovation team focused on emerging technologies. Our work in this area led to strategic investments in the first quarter of 2022 (see C-CE9.6). Results: TransAlta has helped our customers by reliably delivering and operating renewable and storage projects both to the grid and on-site customers so that they receive the energy they require and the environmental outcomes they expect.
Operations	Yes	i) Description of how our strategy for operations has been influenced by climate-related risks and opportunities: The impact of climate-related policy intervention in Alberta and Canada (mandatory timelines on coal plant shutdowns and carbon pricing $50 per tonne CO2e in 2022) has led to our strategy to convert a significant amount of our Alberta coal fleet to natural gas and retire the remaining units. ii) Case study. Situation: In 2014, TransAlta established its first goal to reduce GHG emissions from coal operations and in 2016, we signed a Memorandum of Understanding with the Alberta Government to advance coal to gas conversions. Task: Since 2018, we have maintained the target to provide "No further coal generation by the end of 2025, with 100 per cent of our owned net generation capacity to be from renewables and gas". In addition, our Clean Energy Investment Plan announced in 2019 has supported capital allocation and expenditures towards conversion of coal facilities to gas. Action: In 2021, we achieved an environmental performance milestone in our journey to grow our clean electricity fleet with the completion of our coal-to-gas conversions in Canada. To date, we have retired 4,464 MW of coal-fired generation capacity since 2018 while converting 1,659 MW to natural gas. Thus far, we have retired or converted 90 per cent of our existing coal fleet and will retire the remaining 10 per cent by 2025. Results: We have taken significant steps to reduce our carbon footprint. In 2022, we achieved a total reduction of 68 per cent compared to our 2015 emission levels. Overall, our converted natural gas units' CO2 intensity is approximately 57 per cent less than coal generation. Repurposing the facilities rather than decommissioning them reduces the cost and emissions associated with new construction, provides a shorter operating life that allows the units to support through the transition to lower-emitting technology options and aligns with the UN SDGs, specifically "Goal 9: Industry, Innovation and Infrastructure." The completed conversions and the closure of the Highvale coal mine also contributes to the goals of the Powering Past Coal Alliance, which TransAlta joined in 2021 at COP26.

C3.4

(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Capital expenditures Capital allocation	i) Case study of how climate-related risks and opportunities have influenced our financial planning: Capital allocation and expenditure. Situation: TransAlta's enhanced focus on renewable generation and storage solutions for customers is driven largely by both climate-related risks (need to move away from GHG intensive coal, associated carbon pricing impacts, societal shifts and expectations) and opportunities (conversion of facilities from coal to gas significantly reduces GHG, while supporting a broader lower carbon transition, continued growth in renewable energy to support a low carbon electricity future and our customers' sustainability goals). Task: Our Clean Energy Investment Plan, announced in 2019, included converting our existing Alberta coal assets to natural gas and advancing our leadership position in renewable electricity. Despite significantly reducing our carbon footprint (we have retired 4,464 MW of coal-fired generation capacity since 2018 while converting 1,659 MW to natural gas), we recognized the need to accelerate growth into customer-centred renewables and storage. Action: In 2021, we announced our Clean Electricity Growth Plan which will see the Company deliver 2 GW of renewables growth and 5 GW of development pipeline by 2025. By the end of 2025, we expect 70 per cent of our EBITDA to be derived from renewables. Our 2023 priorities for the Clean Electricity Growth Plan include: (i) Reaching final investment decision on 500 MW of additional clean energy projects across Canada, the US and Australia; and (ii) Adding at least 1,500 MW of new development sites to our pipeline. Results: The evolution of our decarbonization targets from phasing out coal to expanding renewable electricity generation has shaped our Company to become a leader in clean energy in North America. Our investments demonstrate our commitment to a cleaner future and we are on track to enable a two-fold increase in our renewables fleet by 2030. As of Feb. 22, 2023, we have successfully delivered 800 MW of new growth, 40 per cent of our 2 GW target, with a capital investment of 41 per cent of our $3.6 billion target. Our cumulative progress towards our incremental EBITDA target is approximately $149 million, 47 per cent of our $315 million target (2022 Integrated Report, page 15). ii) Time horizon covered by the financial planning: We targeted a capital investment of $3.6 billion by the end of 2025. The new assets, once fully operational are targeted to deliver incremental average annual EBITDA of $315 million. The targeted capital investment of $3 billion and average annual EBITDA of $250 million, as previously disclosed in 2021, were revised upwards for the current inflationary environment in 2023.

C3.5

(C3.5) In your organization's financial accounting, do you identify spending/revenue that is aligned with your organization's climate transition?

	Identification of spending/revenue that is aligned with your organization's climate transition	Indicate the level at which you identify the alignment of your spending/revenue with a sustainable finance taxonomy
Row 1	Yes, we identify alignment with our climate transition plan	<Not Applicable>

C3.5a

(C3.5a) Quantify the percentage share of your spending/revenue that is aligned with your organization's climate transition.

Financial Metric
Other, please specify (Adjusted EBITDA)

Type of alignment being reported for this financial metric
Alignment with our climate transition plan

Taxonomy under which information is being reported
<Not Applicable>

Objective under which alignment is being reported
<Not Applicable>

Amount of selected financial metric that is aligned in the reporting year (unit currency as selected in C0.4)
1467

Percentage share of selected financial metric aligned in the reporting year (%)
90

Percentage share of selected financial metric planned to align in 2025 (%)
100

Percentage share of selected financial metric planned to align in 2030 (%)
100

Describe the methodology used to identify spending/revenue that is aligned
i) Definition of adjusted EBITDA aligned with our climate transition plan: As part of our Clean Electricity Growth Plan announced in 2021, by the end of 2025 we will have achieved a 100 per cent portfolio mix of renewables and natural gas with 70 per cent of EBITDA attributable to renewables. In 2022, TransAlta developed our first consolidated Climate Transition Plan, which lays out our approach to reducing operational and value chain emissions to achieve our new target of net-zero operations by 2045. We believe our Clean Electricity Growth Plan supports achieving this ambitious target. In addition, TransAlta's 2021 climate scenario analysis confirmed the IEA's Net Zero by 2050 ("NZE2050") scenario that notes the requirement for substantial increases in renewables generation and recognizes that natural gas generation will provide a declining but critical portion of power in the transition to beyond 2030 while renewable generation grows rapidly and technologies like energy storage, hydrogen and CCUS become integrated into the electricity system. This means that natural gas assets still play a role to enable a smooth and efficient energy transition. Therefore, we have accounted as 'aligned with our climate transition plan' the adjusted EBITDA generated from renewable sources (hydro, wind and solar) and natural gas and excluded adjusted EBITDA from coal.

ii) Description of methodology to calculate percentage of adjusted EBITDA aligned with our Climate Transition Plan: In the reporting year (2022), we calculated the percentage of 'adjusted EBITDA' figures for renewables and natural gas ($1,467million) compared against the Company-wide total ($1,634 million), resulting in 90 per cent (figures disclosed on page M12 of our 2022 Integrated Report). The 2025 and 2030 adjusted EBITDA estimates were calculated assuming the achievement of our goal -100 per cent portfolio mix of renewables and natural gas.

C4. Targets and performance

C4.1

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

C4.1a

(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.

Target reference number
Abs 1

Is this a science-based target?
Yes, we consider this a science-based target, and the target is currently being reviewed by the Science Based Targets initiative

Target ambition
1.5°C aligned

Year target was set
2021

Target coverage
Company-wide

Scope(s)
Scope 1
Scope 2

Scope 2 accounting method
Location-based

Scope 3 category(ies)
<Not Applicable>

Base year
2015

Base year Scope 1 emissions covered by target (metric tons CO2e)
32041425

Base year Scope 2 emissions covered by target (metric tons CO2e)
186390

Base year Scope 3, Category 1: Purchased goods and services emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 2: Capital goods emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 4: Upstream transportation and distribution emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 5: Waste generated in operations emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 6: Business travel emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 7: Employee commuting emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 8: Upstream leased assets emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 9: Downstream transportation and distribution emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 10: Processing of sold products emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 11: Use of sold products emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 12: End-of-life treatment of sold products emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 13: Downstream leased assets emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 14: Franchises emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 15: Investments emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Other (upstream) emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Other (downstream) emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year total Scope 3 emissions covered by target (metric tons CO2e)
<Not Applicable>

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)
32227815

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1
100

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2
100

Base year Scope 3, Category 1: Purchased goods and services emissions covered by target as % of total base year emissions in Scope 3, Category 1: Purchased goods and services (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 2: Capital goods emissions covered by target as % of total base year emissions in Scope 3, Category 2: Capital goods (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) emissions covered by target as % of total base year emissions in Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 4: Upstream transportation and distribution covered by target as % of total base year emissions in Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 5: Waste generated in operations emissions covered by target as % of total base year emissions in Scope 3, Category 5: Waste generated in operations (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 6: Business travel emissions covered by target as % of total base year emissions in Scope 3, Category 6: Business travel (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 7: Employee commuting covered by target as % of total base year emissions in Scope 3, Category 7: Employee commuting (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 8: Upstream leased assets emissions covered by target as % of total base year emissions in Scope 3, Category 8: Upstream leased assets (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 9: Downstream transportation and distribution emissions covered by target as % of total base year emissions in Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 10: Processing of sold products emissions covered by target as % of total base year emissions in Scope 3, Category 10: Processing of sold products (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 11: Use of sold products emissions covered by target as % of total base year emissions in Scope 3, Category 11: Use of sold products (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 12: End-of-life treatment of sold products emissions covered by target as % of total base year emissions in Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 13: Downstream leased assets emissions covered by target as % of total base year emissions in Scope 3, Category 13: Downstream leased assets (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 14: Franchises emissions covered by target as % of total base year emissions in Scope 3, Category 14: Franchises (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 15: Investments emissions covered by target as % of total base year emissions in Scope 3, Category 15: Investments (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Other (upstream) emissions covered by target as % of total base year emissions in Scope 3, Other (upstream) (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Other (downstream) emissions covered by target as % of total base year emissions in Scope 3, Other (downstream) (metric tons CO2e)
<Not Applicable>

Base year total Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)
<Not Applicable>

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes
100

Target year
2026

Targeted reduction from base year (%)
75

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]
8056953.75

Scope 1 emissions in reporting year covered by target (metric tons CO2e)
10193644

Scope 2 emissions in reporting year covered by target (metric tons CO2e)
54122

Scope 3, Category 1: Purchased goods and services emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 2: Capital goods emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 4: Upstream transportation and distribution emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 5: Waste generated in operations emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 6: Business travel emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 7: Employee commuting emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 8: Upstream leased assets emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 9: Downstream transportation and distribution emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 10: Processing of sold products emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 11: Use of sold products emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 12: End-of-life treatment of sold products emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 13: Downstream leased assets emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 14: Franchises emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 15: Investments emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Other (upstream) emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Other (downstream) emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Total Scope 3 emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)
10247768

Does this target cover any land-related emissions?
No, it does not cover any land-related emissions (e.g. non-FLAG SBT)

% of target achieved relative to base year [auto-calculated]
90.9361349298218

Target status in reporting year
Underway

Please explain target coverage and identify any exclusions
In 2021, TransAlta approved a more stringent climate-related target to reduce 75 per cent of our scope 1 and 2 GHG emissions by 2026 from a 2015 base year. This target accounts for 100 per cent of all our Company-wide scopes 1 and 2 GHG emissions. We estimate that this is in line with limiting global warming to 1.5°C and, in 2021, committed to setting a science-based emissions reduction target, specifically using the sectoral decarbonization approach for electric utilities, through the Science Based Targets initiative ("SBTi"). TransAlta was the first publicly traded electricity company in Canada to commit to setting a science-based emissions target. This goal is aligned

with the UN SDG 13 on climate action.

Plan for achieving target, and progress made to the end of the reporting year
Our 2026 GHG reduction target is a function of our new growth strategy. By focusing on growing our contracted renewables assets, we are growing our business and not our emissions. This type of growth, coupled with coal-to-gas conversions that cut emissions from our thermal assets and efficient on-site cogeneration, creates an emissions pathway for our Company that delivers substantial reductions over the next five years.

One of our major strategic goals is to be coal-free in Canada by the end of 2021 with our sole remaining US unit retiring by 2025. In 2021, we achieved full phase-out of coal in Canada. This means TransAlta's coal facilities in Alberta have been retired or fully transitioned to a 100 per cent natural gas operation. The Highvale coal mine is now closed. In the US, Centralia Unit 1 retired on Dec. 31, 2020, and the remaining unit is set to retire on Dec. 31, 2025. In 2022, our owned net generation capacity from renewables and gas represented approximately 89 per cent of our total 6,246 MW owned net generation capacity.

Our investments and growth strategy are substantially increasing our portfolio of renewable energy-generating assets. In 2021, we announced our Clean Electricity Growth Plan which will see the company execute on 2 GW of renewables growth by 2025. By the end of 2025, we expect 70 per cent of our EBITDA to be derived from renewables.

In addition, we continue to develop new renewable projects that support our customers' sustainability goals to achieve both long-term power price affordability and carbon reductions. Examples of renewable energy projects in 2022 include the construction of: our Garden Plain wind project in Alberta, which is subject to a power purchase agreement ("PPA") with Pembina Pipeline (100 MW) and an investment-grade globally recognized customer (30 MW); our White Rock wind projects in Oklahoma (300 MW), which are subject to two PPAs with Amazon; our Horizon Hill wind project in Oklahoma (200 MW), which is subject to a PPA with a subsidiary of Meta; and our Northern Goldfields solar project with a battery energy storage system in Western Australia (48 MW), which is subject to a PPA with BHP Billiton.

List the emissions reduction initiatives which contributed most to achieving this target
<Not Applicable>

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?
Other climate-related target(s)

C4.2b

(C4.2b) Provide details of any other climate-related targets, including methane reduction targets.

Target reference number
Oth 1

Year target was set
2017

Target coverage
Company-wide

Target type: absolute or intensity
Absolute

Target type: category & Metric (target numerator if reporting an intensity target)

Fossil fuel reduction target	Other, please specify (Installed Coal Capacity (MW))

Target denominator (intensity targets only)
<Not Applicable>

Base year
2017

Figure or percentage in base year
4653

Target year
2026

Figure or percentage in target year
0

Figure or percentage in reporting year
671

% of target achieved relative to base year [auto-calculated]
85.5791962174941

Target status in reporting year
Underway

Is this target part of an emissions target?
TransAlta's target is to achieve "No further coal generation by the end of 2025 with 100 per cent of our owned net generation capacity to be from renewables and gas". This target also builds into our 2026 GHG emission reduction target due to the nature of coal power generation being GHG emissions intensive.

Is this target part of an overarching initiative?
Science Based targets initiative - other

Please explain target coverage and identify any exclusions

As noted previously, in 2021 TransAlta approved a more stringent climate-related target to reduce 75 per cent of our scope 1 and 2 GHG emissions by 2026 from a 2015 base year. We estimate that this is in line with limiting global warming to 1.5°C and, in 2021, committed to setting a science-based emissions reduction target, specifically using the sectoral decarbonization approach for electric utilities, through the Science Based Targets initiative ("SBTi"). This target is aligned with the UN SDG 13 on climate action.

Plan for achieving target, and progress made to the end of the reporting year
One of our major climate-related strategic goals is to be coal-free in Canada by the end of 2021 with the remaining US unit retiring by 2025. In 2021, we achieved full phase-out of coal in Canada. This means TransAlta's thermal facilities in Alberta have been fully transitioned to a 100 per cent natural gas operation. The Highvale coal mine was closed. In the US, Centralia Unit 1 retired on Dec. 31, 2020 and the remaining unit is set to retire on Dec. 31, 2025. In 2022, our owned net generation capacity from renewables and gas represented approximately 89 per cent of our total 6,246 MW owned net generation capacity.

List the actions which contributed most to achieving this target
<Not Applicable>

Target reference number
Oth 2

Year target was set
2021

Target coverage
Company-wide

Target type: absolute or intensity
Absolute

Target type: category & Metric (target numerator if reporting an intensity target)

Renewable fuel production	Other, please specify (Installed Renewable Capacity (MW))

Target denominator (intensity targets only)
<Not Applicable>

Base year
2021

Figure or percentage in base year
2831

Target year
2026

Figure or percentage in target year
4831

Figure or percentage in reporting year
2828

% of target achieved relative to base year [auto-calculated]
-0.15

Target status in reporting year
Underway

Is this target part of an emissions target?
Our new GHG emissions reduction target is a function of our new growth strategy in renewable electricity generation. By focusing on growing our contracted renewables assets, we are growing our business and not our emissions. This type of growth, coupled with coal-to-gas conversions that cut emissions from our thermal assets and efficient on-site cogeneration, creates an emissions pathway for our Company that delivers substantial reductions over the next five years, while continuing to grow our business.

Is this target part of an overarching initiative?
Science Based targets initiative - other

Please explain target coverage and identify any exclusions
In 2021, we announced our Clean Electricity Growth Plan which will see the company execute on 2 GW of renewables growth by 2025. By the end of 2025, we expect 70 per cent of our EBITDA to be derived from renewables.

Plan for achieving target, and progress made to the end of the reporting year
In 2022, we had over 20 renewable projects that were either under construction or in the development stage. We are committed to growing our clean energy fleet and, since 2019, have added over 400 MW of renewables and storage, including utility-scale battery storage. Further, we established organized Canadian, US and Australian clean energy growth teams. In 2022, the Company announced 200 MW of new build renewable projects. TransAlta has established a pipeline of potential growth projects that includes 374 MW of advanced stage development projects along with 3,891 to 4,991 MW of projects in earlier stages of development. The small reduction in our installed renewable capacity in 2022 was a result from the sale of two hydro assets in Ontario, Canada.

List the actions which contributed most to achieving this target
<Not Applicable>

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 initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	18	2783698
To be implemented*	1	136236
Implementation commenced*	4	746826
Implemented*	1	184005
Not to be implemented	0	0

C4.3b

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

Initiative category & Initiative type

Company policy or behavioral change	Other, please specify (Site closure)

Estimated annual CO2e savings (metric tonnes CO2e)
2783698

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 1
Scope 2 (location-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
0

Investment required (unit currency – as specified in C0.4)
0

Payback period
No payback

Estimated lifetime of the initiative
<1 year

Comment
The initiative fully implemented in 2022 was the retirement of TransAlta's natural gas-fired facility Sundance Unit 4 in Alberta, Canada. This supports our climate change strategy as described in section C0.1.

C4.3c

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

Method	Comment
Internal price on carbon	We assess internal projects on a case-by-case basis and at a carbon price of $50 to $170 tonne CO2e. Carbon costs in Alberta were $50/tonne CO2e in 2022 as per Canadian federal rules. Starting in 2023, carbon pricing will increase by $15 annually until 2030 with a $170/tonne price.
Dedicated budget for other emissions reduction activities	TransAlta is a leader in renewable energy development. We have grown our global nameplate renewable energy capacity from approximately 900 MW in 2000 to over 2,800 MW in 2021. We continue to seek opportunities to grow renewable energy. In 2021, we announced our Clean Electricity Growth Plan which will see the Company execute on 2 GW of renewables growth by 2025. In 2022, the plan had a targeted capital investment of $3.6 billion by the end of 2025. The plan will largely be funded from current cash balances, cash generated from operations and asset-level financing. Once fully operational, the new assets are targeted to deliver incremental average annual EBITDA of $250 million.
Dedicated budget for other emissions reduction activities	One of our major strategic goals is to be coal-free by the end of 2025. In Canada, we completed our coal transition at the end of 2021. In the US, our Centralia Unit 1 retired on Dec. 31, 2020 and the remaining unit is set to retire on Dec. 31, 2025. As part of our Clean Energy Investment Plan announced in 2019, we spent $104 million to convert three of our Alberta coal units to natural gas (2021 Integrated Report, page M5). These coal-to-gas conversions repurposed and repositioned our fleet to a cleaner gas, while generating attractive returns by leveraging TransAlta's existing infrastructure. This means TransAlta's coal facilities in Alberta have been retired or fully transitioned to a 100 per cent natural gas operation. Our Highvale coal mine in Alberta closed at the end of 2021 and is now into the reclamation phase. Overall, we have retired or converted 90 per cent of our existing coal fleet and will retire the remaining 10 per cent by 2025.
Compliance with regulatory requirements/standards	Changes in current environmental legislation do and will continue to have, an impact upon our operations and our business in Canada, the US and Australia (e.g., Technology Innovation and Emission Reduction Regulation in Alberta). These changes to regulations may affect our earnings by reducing the operating life of generating facilities and imposing additional costs on the generation of electricity through such measures as emission caps or taxes, requiring additional capital investments in emission abatement technology, or requiring us to invest in offset credits. It is anticipated that these compliance costs will increase as governments develop more stringent climate policies. We manage this environmental compliance risk through investing in renewable energy projects, such as wind, solar and hydro generation and storage technologies.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products?
Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products.

Level of aggregation
Product or service

Taxonomy used to classify product(s) or service(s) as low-carbon
Other, please specify (Our renewable generation qualifies as carbon offsets or RECs under different offset frameworks; hence these are low-carbon facilities / products. They are very close to zero emission facilities from a scope 1 and 2 GHG accounting perspective.)

Type of product(s) or service(s)

Power	Other, please specify (Renewable electricity (hydro, wind and solar))

Description of product(s) or service(s)
One of TransAlta's 19 sustainability targets is to "Develop new renewable projects that support customer sustainability goals to achieve both long-term power price affordability and carbon reductions". We continue to develop renewable and low emission energy facilities to support customers achieving their sustainability goals and targets, such as 100 per cent renewable power targets and/or GHG reduction targets. Production from renewable electricity (hydro, wind and solar) in 2022 resulted in the avoidance of approximately 2.7 million tonnes of CO2e for our customers. In 2022, TransAlta earned $1,014 million in revenue from renewable energy generation. Revenue generated from low-carbon product(s) or service(s) as a percentage of total revenue in the reporting year ($2,976 million) was calculated as follows: $1,014/$2,976 = 34 per cent. For detailed information on the figures used, refer to our 2022 Integrated Report pages M5, M13 and M14.

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)
No

Methodology used to calculate avoided emissions
<Not Applicable>

Life cycle stage(s) covered for the low-carbon product(s) or services(s)
<Not Applicable>

Functional unit used
<Not Applicable>

Reference product/service or baseline scenario used
<Not Applicable>

Life cycle stage(s) covered for the reference product/service or baseline scenario
<Not Applicable>

Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario
<Not Applicable>

Explain your calculation of avoided emissions, including any assumptions
<Not Applicable>

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year
34

Level of aggregation
Group of products or services

Taxonomy used to classify product(s) or service(s) as low-carbon
Other, please specify (EcoLogo, TIER, Alberta Carbon Offset Protocol, Massachusetts SRECs)

Type of product(s) or service(s)

Other	Other, please specify (Environmental attributes that we have the ability to generate, trade, purchase, and sell, including Emission Performance Credits ("EPCs"), Alberta carbon offsets, Renewable Energy Credits ("RECs") and emission offsets.)

Description of product(s) or service(s)
Another way TransAlta can contribute to our customers' sustainability goals is through the use of environmental attributes, which we have the ability to generate, trade, purchase and sell, include EPCs, Alberta carbon offsets, RECs and emission offsets. Alberta carbon offsets can be voluntarily generated by Alberta projects that meet Alberta carbon offset system qualification protocols. Our Alberta wind facilities generate Alberta carbon offset credits. RECs are produced from our renewable energy assets and can be traded in voluntary carbon markets or sold to customers. RECs can be used to meet regulatory requirements when a target for renewable energy generation is set by a jurisdiction or can be used to voluntarily achieve clean electricity procurement goals. Emissions offsets are produced from voluntary projects that reduce emissions in sectors of the economy not covered by carbon reduction regulations. Our customers can use environmental attributes to lower compliance costs attributed to carbon policies or renewable portfolio standards. Further, environmental attributes can help achieve voluntary corporate sustainability or carbon reduction goals. There is a strict qualification, retirement and audit process to ensure EcoLogo RECs, EPCs, Solar Renewable Electricity Credits and carbon offsets are not double sold. In 2022, our environmental attributes revenue was $51 million (2022 Integrated Report, page F32) or 2 per cent of the total revenue ($2,976 million).

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)
No

Methodology used to calculate avoided emissions
<Not Applicable>

Life cycle stage(s) covered for the low-carbon product(s) or services(s)
<Not Applicable>

Functional unit used

<Not Applicable>

Reference product/service or baseline scenario used
<Not Applicable>

Life cycle stage(s) covered for the reference product/service or baseline scenario
<Not Applicable>

Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario
<Not Applicable>

Explain your calculation of avoided emissions, including any assumptions
<Not Applicable>

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year
2

C-EU4.6

(C-EU4.6) Describe your organization's efforts to reduce methane emissions from your activities.

i) Summary of efforts to reduce methane emissions: TransAlta's strategy is focused on the operation of our existing assets (wind, hydro, solar, gas, storage and coal), the phase-out of coal-fired electricity generation and the development of renewable energy and storage projects and low-carbon natural gas generation.

ii) Case study: Ceasing coal-fired electricity generation, resulting in reduction of methane emissions. Situation: Since 2018, we have maintained the target to provide "No further coal generation by the end of 2025 with 100 per cent of our owned net generation capacity to be from renewables and gas". Task: Our Clean Energy Investment Plan, announced in 2019, included converting or retiring our existing Alberta coal assets to natural gas and advancing our leadership position in renewable electricity. In 2021, we announced a Clean Electricity Growth Plan that includes the delivery of 2 GW of incremental renewable capacity with a current targeted capital investment of $3.6 billion by the end of 2025. These initiatives will result in methane or CH4 emission reductions. The operation of renewable energy facilities has close to zero GHG emissions and displaces higher carbon and methane generation. Action: In 2021, we completed our coal-to-gas conversions in Canada. Our Centralia coal facility in the US will be retired by the end of 2025. In 2022, our owned net generation capacity from renewables and gas represented approximately 89 per cent of our total 6,246 MW of owned net generation capacity. Comparatively, our converted natural gas units' CO2 intensity is approximately 57 per cent less than coal generation. Although methane or CH4 specific emissions may increase or hold steady at these facilities, the benefit of the reduced CO2 is substantial. Conversion of our Windsor and Ottawa plants in Ontario to peaking power plant facilities is a good example of TransAlta reducing methane emissions. Results: In 2022, our overall methane emissions were 24,000 tonnes CO2e or 0.2 per cent of our total CO2e emissions (10,248,000 tonnes CO2e). To date, our company-wide methane emissions have reduced 53 per cent from 51,000 tonnes CO2e in 2019. The gas supplied to our Alberta coal-to-gas facilities will be some of the lowest carbon natural gas in the world as Alberta and Canada move forward to meet the federal government's objective of reducing oil and gas methane emissions by at least 75 percent below 2012 levels by 2030.

C5. Emissions methodology

C5.1

(C5.1) Is this your first year of reporting emissions data to CDP?
No

C5.1a

(C5.1a) Has your organization undergone any structural changes in the reporting year, or are any previous structural changes being accounted for in this disclosure of emissions data?

Row 1

Has there been a structural change?
No

Name of organization(s) acquired, divested from, or merged with
<Not Applicable>

Details of structural change(s), including completion dates
<Not Applicable>

C5.1b

(C5.1b) Has your emissions accounting methodology, boundary, and/or reporting year definition changed in the reporting year?

	Change(s) in methodology, boundary, and/or reporting year definition?	Details of methodology, boundary, and/or reporting year definition change(s)
Row 1	No	<Not Applicable>

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

Scope 1

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
32041425

Comment
Our base year is aligned with the Paris Climate Agreement.

Scope 2 (location-based)

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
186390

Comment
Our base year is aligned with the Paris Climate Agreement.

Scope 2 (market-based)

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
0

Comment
No further comments.

Scope 3 category 1: Purchased goods and services

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
503607

Comment
Our accounting group provided our annual spend analysis in 2015 and the sustainability team was able to further categorize these by sector of purchase and enter these values in to the Quantis Scope 3 Evaluator.

Scope 3 category 2: Capital goods

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
125458

Comment
We entered TransAlta capital good expenditures, based on sector of purchase, into the GHG Protocol and Quantis Scope 3 calculator to derive scope 3 emissions from capital goods.

Scope 3 category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2)

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
436100

Comment
We used Alberta Environment emissions factors for extraction and production of gasoline, diesel, natural gas, propane and kerosene. We applied emission intensity (mining emissions/coal combusted) from our own coal mine in Alberta to derive coal extraction emissions for our US coal operations.

Scope 3 category 4: Upstream transportation and distribution

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
84207

Comment
Coal is transported in diesel locomotive freight trains from Montana and Wyoming to our Centralia coal power plant in Washington. To calculate scope 3 emissions from upstream transport of coal, we multiplied the average diesel usage per round trip by the total number of trips (223 in 2015) by the emission factors. Natural gas is distributed in pipelines. We have tie-in points at all of our operations. Some fugitive emissions are associated with natural gas transportation. We considered these to be negligible. Emissions from extraction and production of natural gas are calculated in "Fuel and energy related activities'". Diesel usage from locomotives (delivering coal) was multiplied by mobile combustion source diesel rail emission factors (taken from Environment Canada National Inventory Report and used for both Canada and the US as EPA emission factors were not clear).

Scope 3 category 5: Waste generated in operations

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
23901

Comment
We have implemented a new methodology to replace the spend based method that was previously used to average data through waste tonnage. The figure is updated to more accurately depict our waste management by utilizing the emissions factors under US EPA Table 9. Waste Category.

Scope 3 category 6: Business travel

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
599

Comment
We used the travel provider methodology. Sourced from GRASP Reporting. 17. GREEN PORTFOLIO FRAMEWORK ADDITIONAL RESOURCES - GHG FACTORS Common GHG conversion factors for determining GHG emissions performance based on energy use and travel. Air travel1 Short haul (<281 miles): 0.2897 kg CO2/passenger mile; Medium haul (281-994 miles): 0.2028 kg CO2/passenger mile; Long haul (>994 miles): 0.1770 kg CO2/passenger mile. Rail2 Intercity rail (Amtrak) 0.1909 kg CO2/ passenger mile.

Scope 3 category 7: Employee commuting

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
2975

Comment
We used the GHG Protocol Quantis Scope 3 tool, which takes total employee numbers and applies a methodology. Company size 1000-2500 employees.

Scope 3 category 8: Upstream leased assets

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
0

Comment
Not relevant, explanation provided. TransAlta accounts for emissions from leased assets in its scope 2 emissions.

Scope 3 category 9: Downstream transportation and distribution

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
117958

Comment
A review of the emissions quantification methodology was conducted in 2022. As such, it has been identified that the by-product, ash, generated from coal plants, which is sold as a raw material in cement production will be included in Scope 3 Category 9. This will focus on the transportation of the fly ash from the coal plant to the supplier site.

Scope 3 category 10: Processing of sold products

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
73918

Comment
A review on the emissions quantification methodology was conducted in 2022. As such, it has been identified that the by-product, ash, generated from coal plant, which is sold as a raw material in cement production will be included in Scope 3 Category 10. This will focus on the emissions generated in cement production by the supplier.

Scope 3 category 11: Use of sold products

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
407148

Comment
This accounts for the emissions associated with the sale of natural gas in AB and BC, Canada. The calculation is based on the emissions from the amount of natural gas combusted.

Scope 3 category 12: End of life treatment of sold products

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
0

Comment
There is no end-of-life treatment required for our primary products: wholesale and retail electricity.

Scope 3 category 13: Downstream leased assets

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
0

Comment
TransAlta did not have any applicable downstream leased assets in operation in 2015.

Scope 3 category 14: Franchises

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
0

Comment
TransAlta had no franchises in 2015.

Scope 3 category 15: Investments

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
4349442

Comment
This figure refers to the GHG emissions from sites that we have a financial ownership percentage, but are not the operator. This figure was updated to accurately reflect the ownership percentage for Sheerness (from 50% to 25%).

Scope 3: Other (upstream)

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
0

Comment
No additional upstream exposure.

Scope 3: Other (downstream)

Base year start
January 1 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
0

Comment
No additional downstream exposure.

C5.3

(C5.3) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.
Australia - National Greenhouse and Energy Reporting Act
Environment Canada, Sulphur hexafluoride (SF6) Emission Estimation and Reporting Protocol for Electric Utilities
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)
US EPA Center for Corporate Climate Leadership: Direct Emissions from Stationary Combustion Sources
Other, please specify (Government of Alberta (CCIR/TIER) and Ontario (390/18))

C6. Emissions data

C6.1

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

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)
10193493

Start date
January 1 2022

End date
December 31 2022

Comment
No further comments.

Past year 1

Gross global Scope 1 emissions (metric tons CO2e)
12446737

Start date
January 1 2021

End date
December 31 2021

Comment
No further comments.

Past year 2

Gross global Scope 1 emissions (metric tons CO2e)
16271743

Start date
January 1 2020

End date
December 31 2020

Comment
No further comments.

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
No further comments.

C6.3

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

Reporting year

Scope 2, location-based
54122

Scope 2, market-based (if applicable)
<Not Applicable>

Start date
January 1 2022

End date
December 31 2022

Comment
No further comments.

Past year 1

Scope 2, location-based
57935

Scope 2, market-based (if applicable)
<Not Applicable>

Start date
January 1 2021

End date
December 31 2021

Comment
No further comments.

Past year 2

Scope 2, location-based
88773

Scope 2, market-based (if applicable)
<Not Applicable>

Start date
January 1 2020

End date
December 31 2020

Comment
No further comments.

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1, Scope 2 or Scope 3 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 gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
322097

Emissions calculation methodology
Spend-based method
Other, please specify (GHG Protocol Quantis Scope 3 Evaluator)

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
TransAlta uses our accounting and supply chain database to provide annual spend data for all company divisions. Data (purchases in USD, basic prices) comes from the supplier or service provider and is categorized by 'Broad sector of purchase' per 'Purchase type' using the GHG Protocol Quantis Scope 3 Evaluator.

Capital goods

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
603083

Emissions calculation methodology
Spend-based method
Other, please specify (GHG Protocol Quantis Scope 3 Calculator)

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
TransAlta uses our accounting and supply chain database to provide annual spend data for all company divisions. Data (purchases in USD, basic prices) comes from the supplier or service provider and is categorized by 'Broad sector of purchase' per 'Purchase type' using the GHG Protocol Quantis Scope 3 Evaluator.

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

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
736950

Emissions calculation methodology
Fuel-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
TransAlta consumes a variety of fuels within our operated facilities around the world including coal, natural gas, diesel, oils, greases, propane, gasoline and kerosene. We purchase natural gas for our gas power generation facilities. Gas extraction and production is included in this calculation. The extraction of coal combustion at our Centralia plant is also included in this calculation as we rely on coal deliveries at this plant. This calculation also includes diesel extraction and production. Diesel is occasionally used for combustion in our plants. We also use diesel and gasoline for transportation requirements and propane and kerosene for heating. These have also been included. Emissions factors for extraction and production of gasoline, diesel, natural gas, propane, and kerosene derived from Canada Fuel LCA Model Methodology 2020. We applied emission intensity (mining emissions/coal combustion) from our own coal mine in Alberta to derive coal extraction emissions for our US coal operations.

Upstream transportation and distribution

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
57344

Emissions calculation methodology
Distance-based method
Other, please specify (The actual quantification methodology used to calculate emissions related to rail transportation was completed using the Canadian National Railway (CN Rail) Carbon Calculator online tool)

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Coal is transported in diesel locomotive freight trains from Montana and Wyoming to our Centralia coal power plant in Washington State, in the US. CO2e is calculated using a distance-based method built into an online carbon calculator for rail journey based on publicly available rail company data. We track the distance, number of train cars and shipment weights in order to help determine CO2e. Different weights are applied for the return journey, empty cars, hence the weight of the car only.

Waste generated in operations

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
4822

Emissions calculation methodology
Average data method
Waste-type-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
As part of our annual sustainability reporting, we track our total waste generation (tonnes equivalent), waste to landfill (tonne eq.) and waste recycled (tonne eq.), which received limited assurance in 2022. CO2e is calculated using the average-data method as per the GHG Protocol Technical Guidance for Calculating Scope 3 Emissions. Emission factors applied an average of mixed materials, following guidance from the US Environmental Protection Agency, Emissions Factors for GHG Inventories (April 2022).

Business travel

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
294

Emissions calculation methodology
Distance-based method
Other, please specify (Travel provider methodology uses GraspDATA from Grasp Technologies, a web-based reporting tool for travel companies. Emissions calculation is distance-based (kilometres))

Percentage of emissions calculated using data obtained from suppliers or value chain partners
50

Please explain
Our travel provider produced 2022 data (146,948.9 CO2 Kgs), which we believe represents 50 per cent of our emissions from the transportation of employees for business related activities (air travel). Hence, we conservatively doubled this figure to account for internally booked flights that are outside of our travel provider database. The emissions calculation is distance-based (kilometres) for: Short Haul - less than 452 km, Medium Haul - between 452 km and 1600 km and Long Haul - greater than 1600 km.

Employee commuting

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
4355

Emissions calculation methodology
Distance-based method
Other, please specify (An internal survey was conducted in 2020 to record the commute of TransAlta employees.)

Percentage of emissions calculated using data obtained from suppliers or value chain partners
5

Please explain
The input data included distance travelled (distance-based method), mode of transportation, and updated emission factors as per the US Environmental Protection Agency, Emissions Factors for GHG Inventories (April 2022) for Scope 3 Category 6: Business Travel and Category 7: Employee Commuting. Potential commute changes during summer and winter were accounted for. Our 2022 figures were calculated assuming routines of employees commuting to and from work were kept from 2020 as a result of public health and workplace measures maintained during the COVID-19 pandemic (i.e., employees working from home). Percentage of emissions calculated was based on 65 employees who responded to our internal survey (2020) and their data were used as an estimate for our current 1,222 employee commutes (2022).

Upstream leased assets

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
TransAlta accounts for emissions from leased assets in its scope 2 emissions, hence this is not relevant under our scope 3 emissions.

Downstream transportation and distribution

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
24476

Emissions calculation methodology
Distance-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
46

Please explain
Ash is a by-product generated from coal plant which is used as a raw material in cement production. This figure was calculated based on the total ash sold to vendors for cement production in weight and distance. We received data from one supplier that accounts for 46 per cent of all ash sold. We infered the data to another vendor that did not provide the data.

Processing of sold products

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
93756

Emissions calculation methodology
Average data method
Average product method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
46

Please explain
The product sold, fly ash, is used in cement production. The emissions calculated are based on the emissions generated during cement production and provided by the supplier in their Scope 1 and 2 report and the total tonnage of ash sold.

Use of sold products

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
396545

Emissions calculation methodology
Fuel-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
This figure refers to the amount of physical natural gas that is sold in AB and BC, Canada. We assume the GHG emissions from the final combustion of sold natural gas.

End of life treatment of sold products

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
There is no end-of-life treatment required for our primary product, which is electricity. As per the laws of thermodynamics, energy changes form or is transferred, i.e., electricity powers a light bulb and the energy changes form to radiant energy (light).

Downstream leased assets

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
TransAlta does not lease any assets downstream of its business, hence this is not relevant.

Franchises

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
TransAlta has no franchises, hence this is not relevant.

Investments

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
1380245

Emissions calculation methodology
Investment-specific method
Other, please specify (Technology Innovation and Emissions Reduction (TIER) regulation - Alberta GHG regulations)

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
This figure accounts for all assets owned that TransAlta does not operated. We receive the scope 1 and 2 data from the operator and our ownership percentage.

Other (upstream)

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
TransAlta has no other upstream emissions, hence this is not relevant.

Other (downstream)

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
TransAlta has no other downstream emissions, hence this is not relevant.

C6.5a

(C6.5a) Disclose or restate your Scope 3 emissions data for previous years.

Past year 1

Start date
January 1 2021

End date
December 31 2021

Scope 3: Purchased goods and services (metric tons CO2e)
186811

Scope 3: Capital goods (metric tons CO2e)
60089

Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e)
464022

Scope 3: Upstream transportation and distribution (metric tons CO2e)
49288

Scope 3: Waste generated in operations (metric tons CO2e)
5148

Scope 3: Business travel (metric tons CO2e)
99

Scope 3: Employee commuting (metric tons CO2e)
4551

Scope 3: Upstream leased assets (metric tons CO2e)
0

Scope 3: Downstream transportation and distribution (metric tons CO2e)
39790

Scope 3: Processing of sold products (metric tons CO2e)
68212

Scope 3: Use of sold products (metric tons CO2e)
396545

Scope 3: End of life treatment of sold products (metric tons CO2e)
0

Scope 3: Downstream leased assets (metric tons CO2e)
0

Scope 3: Franchises (metric tons CO2e)
0

Scope 3: Investments (metric tons CO2e)
1772716

Scope 3: Other (upstream) (metric tons CO2e)
0

Scope 3: Other (downstream) (metric tons CO2e)
0

Comment
Three categories for 2021 have been restated, as follows: (i) Category 10 - Processing of sold product. Updated from 63270. We received the actual ash tonnage from vendor to complete the emissions calculations; (ii) Category 11 - Use of sold products. This category has been revamped to include the sale of physical fiscal gas to clients. It was previously zero; and (iii) Category 15 - Investment. Updated from 2327154. Ownership boundary of one of our investment was redefined.

Past year 2

Start date
January 1 2020

End date
December 31 2020

Scope 3: Purchased goods and services (metric tons CO2e)
503607

Scope 3: Capital goods (metric tons CO2e)
125458

Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e)
436100

Scope 3: Upstream transportation and distribution (metric tons CO2e)
84207

Scope 3: Waste generated in operations (metric tons CO2e)
23901

Scope 3: Business travel (metric tons CO2e)
599

Scope 3: Employee commuting (metric tons CO2e)
2975

Scope 3: Upstream leased assets (metric tons CO2e)
0

Scope 3: Downstream transportation and distribution (metric tons CO2e)
117958

Scope 3: Processing of sold products (metric tons CO2e)
73918

Scope 3: Use of sold products (metric tons CO2e)
407148

Scope 3: End of life treatment of sold products (metric tons CO2e)
0

Scope 3: Downstream leased assets (metric tons CO2e)
0

Scope 3: Franchises (metric tons CO2e)
0

Scope 3: Investments (metric tons CO2e)
4349442

Scope 3: Other (upstream) (metric tons CO2e)
0

Scope 3: Other (downstream) (metric tons CO2e)
0

Comment
No further comments.

C6.7

(C6.7) Are carbon dioxide emissions from biogenic 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
0.4

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
10247616

Metric denominator
megawatt hour generated (MWh)

Metric denominator: Unit total
25484898

Scope 2 figure used
Location-based

% change from previous year
33

Direction of change
Decreased

Reason(s) for change
Other emissions reduction activities

Please explain
Reductions in GHG emissions were primarily due to emission reduction initiatives including shutdowns during coal-to-gas conversions and coal unit retirements (as reported in C4.3b). Because we sell the environmental attributes generated from our renewable energy facilities, we do not subtract this amount from our total emissions, but it should be noted that TransAlta's customers are reporting GHG reductions using our renewable energy assets, projects and operations. Actual production from renewable electricity in 2022 resulted in the avoidance of approximately 2.7 million tonnes of CO2e for our customers.

Intensity figure
0.0034

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
10247616

Metric denominator
unit total revenue

Metric denominator: Unit total
2976000000

Scope 2 figure used
Location-based

% change from previous year
25

Direction of change
Decreased

Reason(s) for change
Other emissions reduction activities

Please explain
Reductions in GHG emissions were primarily due to shutdowns during coal-to-gas conversions and coal unit retirements. Revenue increase is mainly due to increases in renewable generation.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?
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	10129908	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	23901	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	39685	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	151	IPCC Fourth Assessment Report (AR4 - 100 year)

C-EU7.1b

(C-EU7.1b) Break down your total gross global Scope 1 emissions from electric utilities value chain activities by greenhouse gas type.

	Gross Scope 1 CO2 emissions (metric tons CO2)	Gross Scope 1 methane emissions (metric tons CH4)	Gross Scope 1 SF6 emissions (metric tons SF6)	Total gross Scope 1 emissions (metric tons CO2e)	Comment
Fugitives	0	0	0.006	151	This is associated with the fugitive emissions from SF6 in the transformers.
Combustion (Electric utilities)	10162219	956	0	10186110	This is associated with coal and gas combustion. N2O emissions were 39,507 tonnes CO2e and were included in the Total gross Scope 1 emissions.
Combustion (Gas utilities)	0	0	0	0	Not Applicable.
Combustion (Other)	7374	0.4	0	7383	This is associated with vehicle GHG emissions. N2O emissions were 177 tonnes CO2e and were included in the Total gross Scope 1 emissions.
Emissions not elsewhere classified	0	0	0	0	Not Applicable.

C7.2

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

Country/area/region	Scope 1 emissions (metric tons CO2e)
Australia	934059
Canada	5167029
United States of America	4092556

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)
Hydro	468
Wind	580
Natural Gas	6241163
Energy Transition (coal power generation)	3951414
Corporate and Energy Marketing	0
Solar	19

C7.3c

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

Activity	Scope 1 emissions (metric tons CO2e)
Coal-fired Power plants	3951051
Natural gas fired power plants	6235017
Fleet vehicles	7383
Breakers - fugitive emissions (SF6)	151
Other - Renewable Energy	42

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 CO2e	Net Scope 1 emissions , 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>
Electric utility activities	10193493	<Not Applicable>	No further comments.
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 (midstream)	<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	<Not Applicable>	<Not Applicable>	<Not Applicable>

C7.7

(C7.7) Is your organization able to break down your emissions data for any of the subsidiaries included in your CDP response?

Not relevant as we do not have any subsidiaries

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 in emissions	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	0	No change	0	There has been no change.
Other emissions reduction activities	2256905	Decreased	18	Total scope 1 and scope 2 (location) emissions reduced by approximately 2,256,905 tCO2e primarily due to shutdowns during coal-to-gas conversions and coal unit retirements (see also C4.3b). Total scope 1 and scope 2 (location) emissions reported for 2021 were 12,504,672 tCO2e; therefore, we arrived at 18 per cent through (-225,6905 /12,504,672) *100 = - 18 per cent (i.e. an 18 per cent decrease).
Divestment	0	No change	0	There has been no change.
Acquisitions	0	No change	0	There has been no change.
Mergers	0	No change	0	There has been no change.
Change in output	0	No change	0	There has been no change.
Change in methodology	0	No change	0	There has been no change.
Change in boundary	0	No change	0	There has been no change.
Change in physical operating conditions	0	No change	0	There has been no change.
Unidentified	0	No change	0	There has been no change.
Other	0	No change	0	There has been no change.

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 25% but less than or equal to 30%

C8.2

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

	Indicate whether your organization undertook this energy-related activity in the reporting year
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 (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	0	54002439	54002439
Consumption of purchased or acquired electricity	<Not Applicable>	0	151568	151568
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>	0	<Not Applicable>	0
Total energy consumption	<Not Applicable>	0	54154007	54154007

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	Yes
Consumption of fuel for the generation of heat	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	Yes

C8.2c

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

Sustainable biomass

Heating value
Unable to confirm heating value

Total fuel MWh consumed by the organization
0

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

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
0

Comment
Not applicable.

Other biomass

Heating value
Unable to confirm heating value

Total fuel MWh consumed by the organization
0

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

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
0

Comment
Not applicable.

Other renewable fuels (e.g. renewable hydrogen)

Heating value
Unable to confirm heating value

Total fuel MWh consumed by the organization
0

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

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
0

Comment
Not applicable.

Coal

Heating value
HHV

Total fuel MWh consumed by the organization
17759857

MWh fuel consumed for self-generation of electricity
17759857

MWh fuel consumed for self-generation of heat
0

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
0

Comment
No further comments.

Oil

Heating value
HHV

Total fuel MWh consumed by the organization
104750

MWh fuel consumed for self-generation of electricity
65198

MWh fuel consumed for self-generation of heat
0

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
0

Comment
No further comments.

Gas

Heating value
HHV

Total fuel MWh consumed by the organization
36127290

MWh fuel consumed for self-generation of electricity
36117572

MWh fuel consumed for self-generation of heat
9718

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
0

Comment
No further comments.

Other non-renewable fuels (e.g. non-renewable hydrogen)

Heating value
Unable to confirm heating value

Total fuel MWh consumed by the organization
0

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

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
0

Comment
Not applicable.

Total fuel

Heating value
HHV

Total fuel MWh consumed by the organization
54154007

MWh fuel consumed for self-generation of electricity
53942627

MWh fuel consumed for self-generation of heat
9718

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
0

Comment
No further comments.

C-EU8.2d

(C-EU8.2d) For your electric utility activities, provide a breakdown of your total power plant capacity, generation, and related emissions during the reporting year by source.

Coal – hard

Nameplate capacity (MW)
0

Gross electricity generation (GWh)
0

Net electricity generation (GWh)
0

Absolute scope 1 emissions (metric tons CO2e)
0

Scope 1 emissions intensity (metric tons CO2e per GWh)
0

Comment
Not applicable.

Lignite

Nameplate capacity (MW)
670

Gross electricity generation (GWh)
3784

Net electricity generation (GWh)
3784

Absolute scope 1 emissions (metric tons CO2e)
3951414

Scope 1 emissions intensity (metric tons CO2e per GWh)
1044.24

Comment
This refers to sub bituminous coal.

Oil

Nameplate capacity (MW)
0

Gross electricity generation (GWh)
0

Net electricity generation (GWh)
0

Absolute scope 1 emissions (metric tons CO2e)
0

Scope 1 emissions intensity (metric tons CO2e per GWh)
0

Comment
Not applicable.

Gas

Nameplate capacity (MW)
2556

Gross electricity generation (GWh)
15424

Net electricity generation (GWh)
15424

Absolute scope 1 emissions (metric tons CO2e)
6235388

Scope 1 emissions intensity (metric tons CO2e per GWh)
404.27

Comment
No further comments.

Sustainable biomass

Nameplate capacity (MW)
0

Gross electricity generation (GWh)
0

Net electricity generation (GWh)
0

Absolute scope 1 emissions (metric tons CO2e)
0

Scope 1 emissions intensity (metric tons CO2e per GWh)
0

Comment
Not applicable.

Other biomass

Nameplate capacity (MW)
0

Gross electricity generation (GWh)
0

Net electricity generation (GWh)
0

Absolute scope 1 emissions (metric tons CO2e)
0

Scope 1 emissions intensity (metric tons CO2e per GWh)
0

Comment
Not applicable.

Waste (non-biomass)

Nameplate capacity (MW)
0

Gross electricity generation (GWh)
0

Net electricity generation (GWh)
0

Absolute scope 1 emissions (metric tons CO2e)
0

Scope 1 emissions intensity (metric tons CO2e per GWh)
0

Comment
Not applicable.

Nuclear

Nameplate capacity (MW)
0

Gross electricity generation (GWh)
0

Net electricity generation (GWh)
0

Absolute scope 1 emissions (metric tons CO2e)
0

Scope 1 emissions intensity (metric tons CO2e per GWh)
0

Comment
Not applicable.

Fossil-fuel plants fitted with CCS

Nameplate capacity (MW)
0

Gross electricity generation (GWh)
0

Net electricity generation (GWh)
0

Absolute scope 1 emissions (metric tons CO2e)
0

Scope 1 emissions intensity (metric tons CO2e per GWh)
0

Comment
Not applicable.

Geothermal

Nameplate capacity (MW)
0

Gross electricity generation (GWh)
0

Net electricity generation (GWh)
0

Absolute scope 1 emissions (metric tons CO2e)
0

Scope 1 emissions intensity (metric tons CO2e per GWh)
0

Comment
Not applicable.

Hydropower

Nameplate capacity (MW)
944

Gross electricity generation (GWh)
1988

Net electricity generation (GWh)
1988

Absolute scope 1 emissions (metric tons CO2e)
468

Scope 1 emissions intensity (metric tons CO2e per GWh)
0.24

Comment
No further comments.

Wind

Nameplate capacity (MW)
1759

Gross electricity generation (GWh)
3696

Net electricity generation (GWh)
3696

Absolute scope 1 emissions (metric tons CO2e)
580

Scope 1 emissions intensity (metric tons CO2e per GWh)
0.16

Comment
No further comments.

Solar

Nameplate capacity (MW)
143

Gross electricity generation (GWh)
185

Net electricity generation (GWh)
185

Absolute scope 1 emissions (metric tons CO2e)
19

Scope 1 emissions intensity (metric tons CO2e per GWh)
0.11

Comment
No further comments.

Marine

Nameplate capacity (MW)
0

Gross electricity generation (GWh)
0

Net electricity generation (GWh)
0

Absolute scope 1 emissions (metric tons CO2e)
0

Scope 1 emissions intensity (metric tons CO2e per GWh)
0

Comment
Not applicable.

Other renewable

Nameplate capacity (MW)
0

Gross electricity generation (GWh)
0

Net electricity generation (GWh)
0

Absolute scope 1 emissions (metric tons CO2e)
0

Scope 1 emissions intensity (metric tons CO2e per GWh)
0

Comment
Not applicable.

Other non-renewable

Nameplate capacity (MW)
0

Gross electricity generation (GWh)
0

Net electricity generation (GWh)
0

Absolute scope 1 emissions (metric tons CO2e)
0

Scope 1 emissions intensity (metric tons CO2e per GWh)
0

Comment
Not applicable.

Total

Nameplate capacity (MW)
6072

Gross electricity generation (GWh)
25077

Net electricity generation (GWh)
25077

Absolute scope 1 emissions (metric tons CO2e)
10187869

Scope 1 emissions intensity (metric tons CO2e per GWh)
406.26

Comment
No further comments.

C8.2g

(C8.2g) Provide a breakdown by country/area of your non-fuel energy consumption in the reporting year.

Country/area
Australia

Consumption of purchased electricity (MWh)
78

Consumption of self-generated electricity (MWh)
0

Is this electricity consumption excluded from your RE100 commitment?
<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)
0

Consumption of self-generated heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
78

Country/area
Canada

Consumption of purchased electricity (MWh)
103995

Consumption of self-generated electricity (MWh)
0

Is this electricity consumption excluded from your RE100 commitment?
<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)
0

Consumption of self-generated heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
103995

Country/area
United States of America

Consumption of purchased electricity (MWh)
47494.7

Consumption of self-generated electricity (MWh)
0

Is this electricity consumption excluded from your RE100 commitment?
<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)
0

Consumption of self-generated heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
47494.7

C-EU8.4

(C-EU8.4) Does your electric utility organization have a transmission and distribution business?
No

C9. Additional metrics

C9.1

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

Description
Energy usage

Metric value
194954424

Metric numerator
GJ

Metric denominator (intensity metric only)
Not applicable.

% change from previous year
4.4

Direction of change
Decreased

Please explain
Total energy usage reduced due to a decrease in coal consumption. One of TransAlta's climate-related targets is to achieve "No further coal generation by the end of 2025 with 100 per cent of our owned net generation capacity to be from renewables and gas".

Description
Waste

Metric value
208000

Metric numerator
tonnes

Metric denominator (intensity metric only)
Not applicable.

% change from previous year
59.6

Direction of change
Decreased

Please explain
Waste generation reduced in ash disposal. In 2022, we reduced total waste generation by 1,325,000 tonnes equivalent or 86 per cent over 2019 levels. This means we achieved our target "By 2022, reduce total waste generation by 80 per cent over a 2019 baseline".

C-EU9.5a

(C-EU9.5a) Break down, by source, your organization's CAPEX in the reporting year and CAPEX planned over the next 5 years.

Coal – hard

CAPEX in the reporting year for power generation from this source (unit currency as selected in C0.4)
0

CAPEX in the reporting year for power generation from this source as % of total CAPEX for power generation in the reporting year
0

CAPEX planned over the next 5 years for power generation from this source as % of total CAPEX planned for power generation over the next 5 years
0

Most recent year in which a new power plant using this source was approved for development
<Not Applicable>

Explain your CAPEX calculations, including any assumptions
We do not have growth-related expenditures for coal-fired electricity generation.

Lignite

CAPEX in the reporting year for power generation from this source (unit currency as selected in C0.4)
0

CAPEX in the reporting year for power generation from this source as % of total CAPEX for power generation in the reporting year
0

CAPEX planned over the next 5 years for power generation from this source as % of total CAPEX planned for power generation over the next 5 years
0

Most recent year in which a new power plant using this source was approved for development
<Not Applicable>

Explain your CAPEX calculations, including any assumptions
Not applicable.

Oil

CAPEX in the reporting year for power generation from this source (unit currency as selected in C0.4)
0

CAPEX in the reporting year for power generation from this source as % of total CAPEX for power generation in the reporting year
0

CAPEX planned over the next 5 years for power generation from this source as % of total CAPEX planned for power generation over the next 5 years
0

Most recent year in which a new power plant using this source was approved for development
<Not Applicable>

Explain your CAPEX calculations, including any assumptions
Not applicable.

Gas

CAPEX in the reporting year for power generation from this source (unit currency as selected in C0.4)
0

CAPEX in the reporting year for power generation from this source as % of total CAPEX for power generation in the reporting year
0

CAPEX planned over the next 5 years for power generation from this source as % of total CAPEX planned for power generation over the next 5 years
9

Most recent year in which a new power plant using this source was approved for development
2021

Explain your CAPEX calculations, including any assumptions
CAPEX planned over the next 5 years refers to amounts to be deployed for our SCE Capacity Expansion project, as part of our future growth projects under advanced-stage development in 2022. We assumed the middle range cost estimates of AU$180-AU$200 (2022 Integrated Report, page M62).

Sustainable biomass

CAPEX in the reporting year for power generation from this source (unit currency as selected in C0.4)
0

CAPEX in the reporting year for power generation from this source as % of total CAPEX for power generation in the reporting year
0

CAPEX planned over the next 5 years for power generation from this source as % of total CAPEX planned for power generation over the next 5 years
0

Most recent year in which a new power plant using this source was approved for development
<Not Applicable>

Explain your CAPEX calculations, including any assumptions
Not applicable.

Other biomass

CAPEX in the reporting year for power generation from this source (unit currency as selected in C0.4)
0

CAPEX in the reporting year for power generation from this source as % of total CAPEX for power generation in the reporting year
0

CAPEX planned over the next 5 years for power generation from this source as % of total CAPEX planned for power generation over the next 5 years
0

Most recent year in which a new power plant using this source was approved for development
<Not Applicable>

Explain your CAPEX calculations, including any assumptions
Not applicable.

Waste (non-biomass)

CAPEX in the reporting year for power generation from this source (unit currency as selected in C0.4)
0

CAPEX in the reporting year for power generation from this source as % of total CAPEX for power generation in the reporting year
0

CAPEX planned over the next 5 years for power generation from this source as % of total CAPEX planned for power generation over the next 5 years
0

Most recent year in which a new power plant using this source was approved for development
<Not Applicable>

Explain your CAPEX calculations, including any assumptions
Not applicable.

Nuclear

CAPEX in the reporting year for power generation from this source (unit currency as selected in C0.4)
0

CAPEX in the reporting year for power generation from this source as % of total CAPEX for power generation in the reporting year
0

CAPEX planned over the next 5 years for power generation from this source as % of total CAPEX planned for power generation over the next 5 years
0

Most recent year in which a new power plant using this source was approved for development
<Not Applicable>

Explain your CAPEX calculations, including any assumptions
Not applicable.

Geothermal

CAPEX in the reporting year for power generation from this source (unit currency as selected in C0.4)
0

CAPEX in the reporting year for power generation from this source as % of total CAPEX for power generation in the reporting year
0

CAPEX planned over the next 5 years for power generation from this source as % of total CAPEX planned for power generation over the next 5 years
0

Most recent year in which a new power plant using this source was approved for development
<Not Applicable>

Explain your CAPEX calculations, including any assumptions
Not applicable.

Hydropower

CAPEX in the reporting year for power generation from this source (unit currency as selected in C0.4)
0

CAPEX in the reporting year for power generation from this source as % of total CAPEX for power generation in the reporting year
0

CAPEX planned over the next 5 years for power generation from this source as % of total CAPEX planned for power generation over the next 5 years
0

Most recent year in which a new power plant using this source was approved for development
<Not Applicable>

Explain your CAPEX calculations, including any assumptions
We did not have growth-related expenditures for hydropower generation in 2022.

Wind

CAPEX in the reporting year for power generation from this source (unit currency as selected in C0.4)
627000000

CAPEX in the reporting year for power generation from this source as % of total CAPEX for power generation in the reporting year
94

CAPEX planned over the next 5 years for power generation from this source as % of total CAPEX planned for power generation over the next 5 years
78

Most recent year in which a new power plant using this source was approved for development
2022

Explain your CAPEX calculations, including any assumptions
This CAPEX includes amounts deployed for growth projects related to wind energy generation, assuming the middle range cost estimates for each project: (i) the construction of the Garden Plain wind project, White Rock wind projects, and Horizon Hill; and (ii) the advanced-stage development of our Tempest wind project (2022 Integrated Report, pages M61-62).

Solar

CAPEX in the reporting year for power generation from this source (unit currency as selected in C0.4)
39000000

CAPEX in the reporting year for power generation from this source as % of total CAPEX for power generation in the reporting year
6

CAPEX planned over the next 5 years for power generation from this source as % of total CAPEX planned for power generation over the next 5 years
3

Most recent year in which a new power plant using this source was approved for development
2021

Explain your CAPEX calculations, including any assumptions
This CAPEX includes amounts deployed for growth projects related to solar energy generation, assuming the middle range cost estimates for the construction of our Northern Goldfields solar project (2022 Integrated Report, page M61).

Marine

CAPEX in the reporting year for power generation from this source (unit currency as selected in C0.4)
0

CAPEX in the reporting year for power generation from this source as % of total CAPEX for power generation in the reporting year
0

CAPEX planned over the next 5 years for power generation from this source as % of total CAPEX planned for power generation over the next 5 years
0

Most recent year in which a new power plant using this source was approved for development
<Not Applicable>

Explain your CAPEX calculations, including any assumptions
Not applicable.

Fossil-fuel plants fitted with CCS

CAPEX in the reporting year for power generation from this source (unit currency as selected in C0.4)
0

CAPEX in the reporting year for power generation from this source as % of total CAPEX for power generation in the reporting year
0

CAPEX planned over the next 5 years for power generation from this source as % of total CAPEX planned for power generation over the next 5 years
0

Most recent year in which a new power plant using this source was approved for development
<Not Applicable>

Explain your CAPEX calculations, including any assumptions
Not applicable.

Other renewable (e.g. renewable hydrogen)

CAPEX in the reporting year for power generation from this source (unit currency as selected in C0.4)
0

CAPEX in the reporting year for power generation from this source as % of total CAPEX for power generation in the reporting year
0

CAPEX planned over the next 5 years for power generation from this source as % of total CAPEX planned for power generation over the next 5 years
0

Most recent year in which a new power plant using this source was approved for development
<Not Applicable>

Explain your CAPEX calculations, including any assumptions
Not applicable.

Other non-renewable (e.g. non-renewable hydrogen)

CAPEX in the reporting year for power generation from this source (unit currency as selected in C0.4)
0

CAPEX in the reporting year for power generation from this source as % of total CAPEX for power generation in the reporting year
0

CAPEX planned over the next 5 years for power generation from this source as % of total CAPEX planned for power generation over the next 5 years
0

Most recent year in which a new power plant using this source was approved for development
<Not Applicable>

Explain your CAPEX calculations, including any assumptions
Not applicable.

C-EU9.5b

(C-EU9.5b) Break down your total planned CAPEX in your current CAPEX plan for products and services (e.g. smart grids, digitalization, etc.).

Products and services	Description of product/service	CAPEX planned for product/service	Percentage of total CAPEX planned products and services	End of year CAPEX plan
Distributed generation	CAPEX figures refer to transmission lines to provide renewable solar electricity supported with a battery energy storage system to BHP Nickel West in Western Australia.	47000000	0.03	2023

C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6

(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?

	Investment in low-carbon R&D	Comment
Row 1	Yes	Research and development activity has fluctuated over time due to cash flow availability, market demands,and capacity of innovation potential. As part of our Clean Electricity Growth Plan, in 2021, we established a new Energy Innovation team to investigate, prioritize and deploy new net-zero electricity generation technologies that address the four pillars of our business: affordability, reliability, safety and non-emitting. As we grow our renewables business, the Energy Innovation team is focused on what we should build next that complements our wind, solar and hydro assets to deliver reliable, affordable and clean electricity to our customers. At the same time, the Energy Innovation team is looking at electrification broadly to investigate where potential new, adjacent business opportunities may exist for TransAlta. Our work in this area led to two investments in the first quarter of 2022: (i) $2 million equity investment in Ekona Power Inc.'s ("Ekona") Series A funding round. The investment will help support the commercialization of Ekona's novel methane pyrolysis technology platform, which produces cleaner and lower-cost turquoise hydrogen; and (ii) a commitment to invest US$25 million over the next four years in EIP's Deep Decarbonization Frontier Fund 1 (the "Frontier Fund") that will invest in early-stage, innovative technology companies that will accelerate the transition to net-zero greenhouse gas emissions. During 2022, the Company invested $10 million (2022 Integrated Report, page F38).

C-CO9.6a/C-EU9.6a/C-OG9.6a

(C-CO9.6a/C-EU9.6a/C-OG9.6a) Provide details of your organization's investments in low-carbon R&D for your sector activities over the last three years.

Technology area	Stage of development in the reporting year	Average % of total R&D investment over the last 3 years	R&D investment figure in the reporting year (unit currency as selected in C0.4) (optional)	Average % of total R&D investment planned over the next 5 years	Explain how your R&D investment in this technology area is aligned with your climate commitments and/or climate transition plan
Other, please specify (Fusion technologies)	Applied research and development	13	1000000	38	Fusion technologies attempt to recreate the fusion reactions in the sun by fusing two hydrogen molecules together. If successful, fusion promises low-cost energy, with far shorter-lived nuclear waste. Fusion achieved some significant development milestones in 2022, including most significantly, Lawrence Livermore National Laboratory achieving net energy gain. This, coupled with unprecedented capital flow into fusion companies, has led to newfound excitement that fusion may be able to leapfrog current generation technologies. Through the Energy Impact Partners ("EIP"), TransAlta has developed a partnership with ZAP Energy, a leading fusion start up. ZAP Energy's technology stabilizes the hydrogen plasma using sheared flow (driving current through the flow creating the magnetic field confining and compressing the plasma) rather than magnetic fields. In September 2022, ZAP announced it will conduct a feasibility study of retrofitting the former TransAlta Big Hanaford gas plant located in Centralia, Washington, to host its first-of-a-kind Z-pinch fusion pilot plant. ZAP received $1 million from the Centralia Coal Transition Grants Energy Technology Board as part of our energy transition investments to move away from coal in Washington State. The 'average percentage of total R&D investment over the last 3 years' was calculated as follows: $1 million (grant received by ZAP) divided by $8 million (US$6 million was the total investment by the Energy Technology Board from 2019 to 2022), resulting in 13 per cent of the total R&D investment over the last 3 years. The 'average percentage of total R&D investment planned over the next 5 years' was calculated as follows: $13 million (US$10 million is the remaining investment by the Energy Technology Board from 2023 to 2025) divided by $34 million (US$25 million was the total investment), resulting in 38 per cent of the total R&D investment planned over the next 5 years.
Other, please specify (This refers to a portfolio approach to investing in emerging technologies and the opportunity to identify, pilot, commercialize and bring to market emerging technologies that will facilitate the transition to net-zero emissions)	Applied research and development	29	10000000	71	On May 5, 2022, the Company entered into a commitment to invest US$25 million over the next four years in Energy Impact Partners ("EIP") Deep Decarbonization Frontier Fund 1 (the "Frontier Fund"). During 2022, the Company invested $10 million (US$8 million). The investment in the Frontier Fund provides the Company with a portfolio approach to invest in emerging technologies and the opportunity to identify, pilot, commercialize and bring to market emerging technologies that will facilitate the transition to net-zero emissions (2022 Integrated Report, page F38). The 'average percentage of total R&D investment over the last 3 years' was calculated as follows: $10 million (US$8 million invested in 2022) divided by $34 million (US$25 million was the total investment), resulting in 29 per cent of the total R&D investment over the last 3 years. The 'average percentage of total R&D investment planned over the next 5 years' was calculated as follows: $24 million (remaining investment amount) divided by $34 million (US$25 million was the total investment), resulting in 71 per cent of the total R&D investment planned over the next 5 years.

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 emissions, and attach the relevant statements.

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
2022.12.31-TAC-Annual-Report-Final.pdf

Page/ section reference
Pages 265-268 of TransAlta's 2022 Integrated Report.

Relevant standard
ISAE 3410

Proportion of reported emissions verified (%)
100

C10.1b

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

Scope 2 approach
Scope 2 location-based

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
2022.12.31-TAC-Annual-Report-Final.pdf

Page/ section reference
Pages 265-268 of TransAlta's 2022 Integrated Report.

Relevant standard
ISAE 3410

Proportion of reported emissions verified (%)
100

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
C6. Emissions data	Year on year change in emissions (Scope 1)	The International Standard for Assurance Engagements Other Than Audits or Reviews of Historical Financial Information ("ISAE 3000") and the International Standard for Assurance Engagements 3410, Assurance Engagements on Greenhouse Gas Statements ("ISAE 3410").	Assurance Statement is available on pages 265-268 of TransAlta's 2022 Integrated Report. 2022.12.31-TAC-Annual-Report-Final.pdf
C6. Emissions data	Year on year change in emissions (Scope 2)	The International Standard for Assurance Engagements Other Than Audits or Reviews of Historical Financial Information ("ISAE 3000") and the International Standard for Assurance Engagements 3410, Assurance Engagements on Greenhouse Gas Statements ("ISAE 3410").	Assurance Statement is available on pages 265-268 of TransAlta's 2022 Integrated Report. 2022.12.31-TAC-Annual-Report-Final.pdf
C6. Emissions data	Year on year change in emissions (Scope 1 and 2)	The International Standard for Assurance Engagements Other Than Audits or Reviews of Historical Financial Information ("ISAE 3000") and the International Standard for Assurance Engagements 3410, Assurance Engagements on Greenhouse Gas Statements ("ISAE 3410").	Assurance Statement is available on pages 265-268 of TransAlta's 2022 Integrated Report. 2022.12.31-TAC-Annual-Report-Final.pdf
C6. Emissions data	Year on year emissions intensity figure	The International Standard for Assurance Engagements Other Than Audits or Reviews of Historical Financial Information ("ISAE 3000") and the International Standard for Assurance Engagements 3410, Assurance Engagements on Greenhouse Gas Statements ("ISAE 3410").	Assurance Statement is available on pages 265-268 of TransAlta's 2022 Integrated Report. 2022.12.31-TAC-Annual-Report-Final.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.

Alberta TIER - ETS
Australia ERF Safeguard Mechanism - ETS
Ontario EPS - ETS
Washington CAR - ETS

C11.1b

(C11.1b) Complete the following table for each of the emissions trading schemes you are regulated by.

Alberta TIER - ETS

% of Scope 1 emissions covered by the ETS
40

% of Scope 2 emissions covered by the ETS
0

Period start date
January 1 2022

Period end date
December 31 2022

Allowances allocated
2736111

Allowances purchased
1297496

Verified Scope 1 emissions in metric tons CO2e
4033607

Verified Scope 2 emissions in metric tons CO2e
0

Details of ownership
Facilities we own and operate

Comment
In the Alberta TIER - ETS, we receive as free allocation on total emissions at 0.37t/MWh and we are obligated to comply on the remaining emissions based on the facility emissions intensity. This is a carbon tax regulation with a tradeable component for compliance. Facilities subject to TIER must meet their emissions benchmark by increasing their year-over-year operating efficiencies or, to the extent they cannot meet the benchmark, they must either: (i) use emission performance credits generated from facilities that have met and exceeded their own emissions target; (ii) use emissions offsets from organizations that are not regulated by TIER but have voluntarily reduced their emissions; or (iii) pay into the TIER fund to purchase a fund credit at the prevailing carbon price ($50 in 2022) in dollars per tCO2e.

'Allowances purchased' represent the compliance obligation on excess emissions above the allowable emissions based on the performance standards of 0.37tCO2e/MWh in 2022. 'Allowances allocated' were calculated as follows: 'Verified scope 1 emissions' - 'Allowances purchased' (4,033,607 tCO2e - 1,297,496tCO2e = 2,736,111tCO2e).

Australia ERF Safeguard Mechanism - ETS

% of Scope 1 emissions covered by the ETS
9

% of Scope 2 emissions covered by the ETS
0

Period start date
January 1 2022

Period end date
December 31 2022

Allowances allocated
934059

Allowances purchased
0

Verified Scope 1 emissions in metric tons CO2e
934059

Verified Scope 2 emissions in metric tons CO2e
0

Details of ownership
Facilities we own and operate

Comment
The Australia ERF Safeguard Mechanism - ETS has been in place since 2016. It provides a legislated framework that limits the emissions of large industrial facilities, including the electricity sector that is regulated as one entity. Emissions limits for individual facilities (and for the electricity sector as a one block) are known as baselines.

'Allowances purchased' represent the compliance obligation in 2022. 'Allowances allocated' were calculated as follows: 'Verified scope 1 emissions' - 'Allowances purchased' (934,059tCO2e - 0tCO2e = 934,059tCO2e).

Ontario EPS - ETS

% of Scope 1 emissions covered by the ETS
11

% of Scope 2 emissions covered by the ETS
0

Period start date
January 1 2022

Period end date
December 31 2022

Allowances allocated
1005668

Allowances purchased
144462

Verified Scope 1 emissions in metric tons CO2e
1150130

Verified Scope 2 emissions in metric tons CO2e
0

Details of ownership
Facilities we own and operate

Comment
The Ontario EPS - ETS is a carbon tax system aimed at encouraging the industrial sector to reduce GHGs emissions. Emissions performance standards are used to determine emissions limit that industrial facilities must meet each year.

'Allowances purchased' represent the compliance obligation on excess emissions above the allowable emissions based on the performance standards of 0.37tCO2e/MWh in 2022. 'Allowances allocated' were calculated as follows: 'Verified scope 1 emissions' - 'Allowances purchased' (1,150,130tCO2e - 144,462tCO2e = 1,005,668tCO2e).

Washington CAR - ETS

% of Scope 1 emissions covered by the ETS
39

% of Scope 2 emissions covered by the ETS
0

Period start date
January 1 2022

Period end date
December 31 2022

Allowances allocated
3963823

Allowances purchased
0

Verified Scope 1 emissions in metric tons CO2e
3963823

Verified Scope 2 emissions in metric tons CO2e
0

Details of ownership
Facilities we own and operate

Comment
The Washington CAR - ETS is meant to cap and reduce GHG emissions from significant in-state stationary sources operating within Washington. The Clean Electricity Transformation Act applies to all electric utilities serving retail customers in Washington and sets specific milestones to reach the required 100 per cent clean electricity supply by 2045 with no provision for offsets.

'Allowances purchased' represent the compliance obligation in 2022. 'Allowances allocated' were calculated as follows: 'Verified scope 1 emissions' - 'Allowances purchased' (3,963,823tCO2e - 0tCO2e = 3,963,823tCO2e).

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

Carbon cost has become an important factor in all investment decisions taken by TransAlta. Our strategy is to participate in carbon pricing markets from a design, process, and continuous improvement standpoint, as well as strategically for the purpose of either lowering compliance costs (i.e., optimize facilities) or generating revenue (i.e., emission performance credits, offsets, trading). TransAlta's exposure to carbon compliance costs is mitigated through the use of eligible emission credits generated from the Company's Wind, Solar and Hydro segments, as well as, purchasing emission credits from the market at prices lower than the regulated compliance price of carbon. Emission credits generated from our Alberta business have no recorded book value but are expected to be used to offset emission obligations from our gas facilities located in Canada in the future when the compliance price of carbon is expected to increase, resulting in a reduced cash cost for carbon compliance.

TransAlta has employment positions dedicated to managing and complying with all the carbon programs in our operating jurisdictions. These individuals work to ensure we respect the prerequisite and compliance rules of each market and comment and participate in the implementation of new markets and/or new instruments. From the trader to the compliance analyst, to the emission engineer we make sure that TransAlta has the knowledge to understand these different carbon programs. Our contributions to policy design of the Carbon Competitiveness Incentive Regulation ("CCIR") and the Technology Innovation and Emission Reduction Regulation "TIER") in Alberta helped secure opt in for origination of carbon offset credits from our hydro and a number of wind facilities in the province. Carbon offsets currently track the carbon price in Alberta which was $50/tonne in 2022 and we expect to generate additional revenue as the Alberta carbon price escalates as forecasted, significantly adding value to our renewable facilities and to shareholders.

C11.2

(C11.2) Has your organization canceled any project-based carbon credits within the reporting year?

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.

Type of internal carbon price
Other, please specify (Carbon taxes)

How the price is determined
Alignment with the price of a carbon tax

Objective(s) for implementing this internal carbon price
Drive low-carbon investment
Identify and seize low-carbon opportunities
Navigate GHG regulations
Stakeholder expectations
Stress test investments

Scope(s) covered
Scope 1
Scope 2

Pricing approach used – spatial variance
Differentiated

Pricing approach used – temporal variance
Evolutionary

Indicate how you expect the price to change over time
In jurisdictions with a clear regulatory framework or policy plan for carbon, we adopt these as our planning tools e.g., TIER in Alberta where we paid $50/tonne in 2022. In Canada, we modelled carbon price at $65/tonne in 2023, rising to $170 by 2030. In jurisdictions without a uniform carbon pricing approach, the US and Australia, we apply scenario analysis to an effective carbon price to guide decisions; in many cases we have built in contract protection through flow of carbon pricing to the customer. In jurisdictions where attractive offset potential exists, such as when we do produce offset credits at the prevailing carbon price from many of our Alberta renewable facilities, carbon price is taken into consideration along with a number of other factors (e.g., stability of the offset market).

Actual price(s) used – minimum (currency as specified in C0.4 per metric ton CO2e)
50

Actual price(s) used – maximum (currency as specified in C0.4 per metric ton CO2e)
50

Business decision-making processes this internal carbon price is applied to
Capital expenditure
Operations
Public policy engagement

Mandatory enforcement of this internal carbon price within these business decision-making processes
Yes, for all decision-making processes

Explain how this internal carbon price has contributed to the implementation of your organization's climate commitments and/or climate transition plan
i) Explanation: Over the past decade, TransAlta has been shifting from providing a GHG-intensive product to a low-carbon product. The impact of climate-related policy intervention in Alberta, Canada (mandatory timelines on coal plant shutdowns and carbon pricing at $50 per tonne CO2e in 2022) has led to our strategy to convert a significant amount of our Alberta coal fleet to natural gas and retire the remaining units. ii) Case study. Situation: In 2014, TransAlta established our first goal to reduce GHG emissions from coal operations and in 2016 we signed a Memorandum of Understanding with the Alberta Government to advance coal to gas conversions. Task: Since 2018, we have maintained the target to provide "No further coal generation by the end of 2025 with 100 per cent of our owned net generation capacity to be from renewables and gas" (see C3.3, case study for products and services). In addition, our Clean Energy Investment Plan announced in 2019 has supported capital allocation and expenditures towards conversion of coal facilities to gas. Action: Our coal-to-gas transition in Alberta, completed in 2021, was influenced by carbon pricing and other factors such as electricity prices, industry trends towards cleaner power solutions, customer preference towards sustainable products and external market forces. Carbon costs to run coal in an Alberta $50/tonne carbon price environment are approximately $40/MWh. This would increase in 2023 as carbon prices are expected to rise to $65/tonne, in line with Canadian federal guidance. The conversion of coal units to gas significantly reduces carbon costs/MWh. For example, in a modelled $50 carbon price environment, carbon costs are approximately $20/MWh for coal facilities converted to gas through boiler conversions. For coal facilities repowered to gas, emission costs are close to zero in Alberta. Our analysis is based on a sub-critical unit, $50 per tonne carbon price, and 0.37 tonne CO2e /MWh performance standard. Emission costs include carbon and, in the case of coal, mercury, NOx and SOx. Analysis will vary depending on heat rate and capacity factors. Results: In 2022, we achieved a total GHG emissions reduction of 68 per cent compared to 2015 levels. Overall, our converted natural gas units' CO2 intensity is approximately 57 per cent less than coal generation. To date, we have retired 4,464 MW of coal-fired generation capacity since 2018 while converting 1,659 MW to natural gas.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?
Yes, our customers/clients
Yes, other partners in the value chain

C12.1b

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

Type of engagement & Details of engagement

Collaboration & innovation	Run a campaign to encourage innovation to reduce climate change impacts

% of customers by number

41

% of customer - related Scope 3 emissions as reported in C6.5

0

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

TransAlta serves industrial and commercial customers with power and energy services across our fleet in Canada, the US and Australia. We are focused on customer-centred renewables growth to bring high levels of service quality and reliability for our customers in a low carbon future. We continue to develop renewable and low emitting energy facilities to support customers achieving their sustainability goals and targets, such as 100 per cent renewable power targets and/or GHG reduction targets. Hence, selected scope of engagement with customers is to provide clean electricity.

Our climate-related engagement strategy with our customers supports our Clean Electricity Growth Plan, which will see the Company execute on 2 GW of renewables growth by 2025 from 2021 levels. Today, our renewable fleet makes us one of the largest renewable power producers in North America, one of the largest producers of wind power in Canada and the largest producer of hydro power in Alberta. We help our customers by reliably delivering and operating renewable and storage projects and on-site generation that meet their energy needs.

The scope of engagement and the group of customers refer to 2022-2023 wind and solar developments (see C2.4b): our Garden Plain wind project in Alberta is subject to a power purchase agreement ("PPA") with Pembina and an investment-grade customer, our White Rock wind projects in Oklahoma are subject to a PPA with Amazon, our Northern Goldfields solar project with a battery energy storage system in Western Australia is subject to a PPA with BHP Billiton and our Horizon Hill wind project is subject to a long-term PPA with Meta. All are examples of a tailored approach designed to meet the unique needs of customers as they advance their own decarbonization goals. In the future, we see more demand for reliable zero-emission electricity and our growth strategy is designed to position the Company to deliver these projects effectively for new and existing partners in all our markets.

Impact of engagement, including measures of success

We measure the success of our engagement through growth in our zero- and low-carbon generation fleet. Our long-term average production from renewable sources increased 17 per cent to 6,965 GWh in 2022 from 5,946 GWh in 2020. This is calculated based on our portfolio as at Dec. 31, 2022, on an annualized basis from the average annual energy yield predicted from our simulation model based on historical resource data performed over a period of typically 30-35 years for the Wind and Solar business segment and 36 years for the Hydro business segment (2022 Integrated Report, page M12). Actual production from renewable electricity in 2022 resulted in the avoidance of approximately 2.7 million tonnes of CO_2e for our customers. Our investments and growth in renewable energy are highlighted by our portfolio of renewable energy-generating assets. From 2000 to 2022, we grew our nameplate renewables capacity from approximately 900 MW to over 2,900 MW. Percentage of customers was calculated as the percentage of total estimated production from the four selected wind and solar developments (2,576 GWh) compared to the total 2022 actual production from renewable sources (6,236 GWh) as follows: 2,576 GWh/6,236 GWh = 41 per cent. The total estimated CO_2e avoidance is approximately 1.3 million tonnes.

C12.1d

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

In addition to suppliers and customers, we also engage with stakeholders on climate-related matters. Our stakeholders are identified through stakeholder mapping exercises conducted for each facility and prospective project development or acquisition. A key focus of our work is to support business growth through proactive engagement with stakeholders in our geographic operating areas in Canada, the US and Australia to develop and maintain relationships, assess needs and fit and seek out collaborative and sustainable opportunities. For example, in 2022 we have identified the potential for 3,891 to 4,991 MW of global installed capacity through 23 early-stage development projects, which will help deliver 2 GW of incremental renewable capacity by the end of 2025 as part of our Clean Electricity Growth Plan (2022 Integrated Report, page M62). These projects may have collected meteorological data, started environmental studies and will provide opportunity for engagement with stakeholders. Our stakeholder engagement practices are guided by regulatory requirements, industry best practices, international standards and corporate policies. This helps ensure stakeholder concerns are identified and can be addressed early in the development process, thereby minimizing project delays. We conduct consultation primarily during project development and construction and maintain engaged communication throughout operations to decommissioning. Specific examples of climate-related stakeholder engagement in 2022 regarding our Canadian fleet include: the WaterCharger battery energy storage project, the Highvale Mine decommissioning and reclamation plan, the Tempest wind project and the Bow River management with local stakeholders and recreational users (2022 Integrated Report, page M105).

TransAlta has supported workers and communities in the US and Canada during our energy transition. In 2015, we announced a US$55 million community investment over 10 years to support energy efficiency, economic and community development and education and retraining initiatives in Washington State. The US$55 million community investment is part of the TransAlta Energy Transition Bill, passed in 2011. This bill was a historic agreement between policymakers, environmentalists, labour leaders and TransAlta to transition away from coal in Washington State, closing the Centralia facility's two units, one in 2020 and the other in 2025. Three funding boards were formed to invest the US$55 million: the Weatherization Board (US$10 million), the Economic & Community Development Board (US$20 million) and the Energy Technology Board (US$25 million). To date, a total of US$39.5 million have been invested: the Weatherization Board has invested US$9.5 million, the Economic and Community Development Board US$15 million and the Energy Technology Board US$15 million. Specific projects that the boards funded in 2022 include a grant to Twin Transit in support of the installation of Southwest Washington's first Containerized Green Hydrogen Electrolyzer at the Port of Chehalis, providing a reliable source of local hydrogen and proximity to the market; financial support to the Formic Liquid Hydrogen Carrier Clean Energy Demonstration Project at the Port of Tacoma and other locations in the state of Washington, an initiative to replace the use of fossil fuels in the refrigeration of cargo containers; and funding to support solar systems for organizations and non-profits in Washington. In Canada, in 2016 TransAlta announced that we had reached an agreement with the Government of Alberta for the cessation of coal-fired emissions from coal-fired electricity generation facilities in Alberta (Off-Coal Agreement). As part of the Off-Coal Agreement, TransAlta has invested in programs and initiatives to support the communities surrounding the plants negatively impacted by the phase-out of coal generation during the transition (2022 Integrated Report, pages M100-101).

C12.2

(C12.2) Do your suppliers have to meet climate-related requirements as part of your organization's purchasing process?

No, but we plan to introduce climate-related requirements within the next two years

C12.3

(C12.3) Does your organization engage in activities that could either directly or indirectly influence policy, law, or regulation that may impact the climate?

Row 1

External engagement activities that could directly or indirectly influence policy, law, or regulation that may impact the climate

Yes, we engage directly with policy makers

Yes, our membership of/engagement with trade associations could influence policy, law, or regulation that may impact the climate

Does your organization have a public commitment or position statement to conduct your engagement activities in line with the goals of the Paris Agreement?

Yes

Attach commitment or position statement(s)

" We are committed to maintaining a leadership position in climate change and contributing to a net-zero future. Our growth strategy focuses on renewable and storage projects, which is in line with the Paris Agreement goal to limit global warming to 1.5°C." (2022 Integrated Report, page M73). Since 2005, our carbon reductions alone have contributed to approximately 10 per cent of Canada's Paris Agreement target (2022 Integrated Report, page 2).
2022.12.31-TAC-Annual-Report-Final.pdf

Describe the process(es) your organization has in place to ensure that your external engagement activities are consistent with your climate commitments and/or climate transition plan

Our strategy ensures that our activities support low carbon policy. We actively engage policymakers and stakeholders on how to facilitate a transition where the electricity systems we serve can reach net-zero emissions while maintaining reliability and affordability. TransAlta has a single function responsible for overseeing engagement - members of our government relations and regulatory teams are expected to represent these corporate positions when engaging with policy makers or trade associations. As previously noted, we support smart carbon pricing that ensures competitiveness for the electricity sector, while reducing carbon emissions.

TransAlta is currently in a multi-year transition to convert or retire all our coal units completely by the end of 2025. Our Clean Energy Investment Plan, announced in 2019, included converting our existing Alberta coal assets to natural gas and advancing our leadership position in renewable electricity. To date, we have retired 4,664 MW of coal-fired generation capacity since 2018 while converting 1,659 MW to natural gas, significantly reducing our carbon footprint. In 2021, we completed our off-coal transition in Canada and our remaining coal-fired facility in the US is committed to be retired on December 31, 2025. In 2021, we announced a Clean Electricity Growth Plan that includes climate-related strategic targets: (i) Deliver 2GW of incremental renewable capacity with a targeted capital investment of $3.6 billion by the end of 2025; (ii) Accelerate growth in customer-centred renewable energy solutions through the deployment of our 3 GW development pipeline; (iii) Enable a two-fold increase in renewables by 2030; and (iv) Achieve 70 per cent of EBITDA from renewables and storage by the end of 2025 (see C.01)

Specific climate-related targets include:
- By 2026, achieve a 75 per cent reduction of scope 1 and 2 GHG emissions from a 2015 base year;
- By 2045, achieve net-zero for 100 per cent of TransAlta's scope 1 and 2 GHG emissions;
- By 2024, verify and disclose 80 per cent of TransAlta's scope 3 emissions;
- No further coal generation by the end of 2025 with 100 per cent of our owned net generation capacity to be from renewables and gas; and
- Develop new renewable projects that support our customers' sustainability goals to achieve both long-term power price affordability and carbon reductions.

Primary reason for not engaging in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate

<Not Applicable>

Explain why your organization does not engage in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate

<Not Applicable>

C12.3a

(C12.3a) On what policy, law, or regulation that may impact the climate has your organization been engaging directly with policy makers in the reporting year?

Specify the policy, law, or regulation on which your organization is engaging with policy makers
Technology Innovation and Emissions Reduction (TIER) regulation

Category of policy, law, or regulation that may impact the climate
Carbon pricing, taxes, and subsidies

Focus area of policy, law, or regulation that may impact the climate
Carbon taxes

Policy, law, or regulation geographic coverage
Regional

Country/area/region the policy, law, or regulation applies to
Other, please specify (Alberta)

Your organization's position on the policy, law, or regulation
Support with no exceptions

Description of engagement with policy makers
We actively participated in the carbon market redesign and advocated for design that would ensure competitiveness, growth and job creation in Alberta, while succeeding at reducing emissions. Following our engagement, a large majority of our Alberta hydro facilities and wind facilities were qualified to generate carbon offset credits under the current Technology Innovation and Emissions Reduction ("TIER") regulation, which results in additional revenue for TransAlta at the TIER per tonne CO2e price ($50/tonne in 2022) and enhances the competitiveness of these assets relative to fossil-generation units. We advocated that these facilities, which are renewable facilities, continue to be included within the carbon offset component of TIER.

Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation
<Not Applicable>

Have you evaluated whether your organization's engagement on this policy, law, or regulation is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

Please explain whether this policy, law or regulation is central to the achievement of your climate transition plan and, if so, how?
This regulation is not central to the achievement of our climate transition plan.

Specify the policy, law, or regulation on which your organization is engaging with policy makers
Clean Electricity Regulations (CER)

Category of policy, law, or regulation that may impact the climate
Climate change mitigation

Focus area of policy, law, or regulation that may impact the climate
Renewable energy generation

Policy, law, or regulation geographic coverage
National

Country/area/region the policy, law, or regulation applies to
Canada

Your organization's position on the policy, law, or regulation
Support with no exceptions

Description of engagement with policy makers
TransAlta core convictions are that the price of renewables will continue declining, the price of battery storage will continue to decline and demand for clean electricity will increase. We continue to engage policymakers and stakeholders regarding the best way to facilitate a transition where the electricity systems we serve can reach net-zero emissions while maintaining competitive costs and reliability. We will continue to invest in renewables and assess the best options to deliver reliability through energy storage, including incorporating learnings from our industrial-scale battery into our corporate strategy and sharing those learnings with government. At the same time, we agree with the Government of Canada's view that natural gas will play an important role within a net-zero grid in the coming decades, providing generation to support system demands and intermittent renewable generation. Example of our engagement with policy makers: In May 2023, our EVP, Legal, Commercial and External Affair joined the Canada Electricity Advisory Council, an independent body of 19 experts who will provide the Government of Canada with advice on actions needed to achieve our 2035 and 2050 net-zero emissions goals as they pertain to electricity.

Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation
<Not Applicable>

Have you evaluated whether your organization's engagement on this policy, law, or regulation is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

Please explain whether this policy, law or regulation is central to the achievement of your climate transition plan and, if so, how?
This regulation is not central to the achievement of our Climate Transition Plan.

C12.3b

(C12.3b) Provide details of the trade associations your organization is a member of, or engages with, which are likely to take a position on any policy, law or regulation that may impact the climate.

Trade association
Other, please specify (Independent Power Producers Society of Alberta (IPPSA))

Is your organization's position on climate change policy consistent with theirs?
Consistent

Has your organization attempted to influence their position in the reporting year?
Yes, we publicly promoted their current position

Describe how your organization's position is consistent with or differs from the trade association's position, and any actions taken to influence their position
We are aligned with IPPSA on the need for a transition to a lower carbon grid in Alberta. At TransAlta we support smart carbon pricing policies that support competitiveness, while reducing carbon emissions.

Funding figure your organization provided to this trade association in the reporting year (currency as selected in C0.4)
0

Describe the aim of your organization's funding
<Not Applicable>

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

Trade association
Other, please specify (Electricity Canada)

Is your organization's position on climate change policy consistent with theirs?
Consistent

Has your organization attempted to influence their position in the reporting year?
Yes, we publicly promoted their current position

Describe how your organization's position is consistent with or differs from the trade association's position, and any actions taken to influence their position
Electricity Canada advocates for rational climate change policy with the Canadian federal government as it relates to the electricity sector.

Funding figure your organization provided to this trade association in the reporting year (currency as selected in C0.4)
0

Describe the aim of your organization's funding
<Not Applicable>

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

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, incorporating the TCFD recommendations

Status
Complete

Attach the document
2022.12.31-TAC-Annual-Report-Final.pdf

Page/Section reference
For details on climate-related disclosure, refer to pages M78 to M96 of our 2022 Integrated Report.

Content elements
Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment
Climate-related data to be disclosed is informed by climate change questionnaires from CDP and the Task Force on Climate-related Financial Disclosures ("TCFD") recommendations. In 2022, TransAlta developed our first consolidated Climate Transition Plan, which lays out our approach to reducing operational and value chain emissions to deliver net-zero operations by 2045. In addition, our Climate Transition Plan includes sustainable finance and inclusive transition actions reflecting TransAlta's commitment to a successful transition toward a low-carbon economy. In 2021, we conducted a climate-related scenario analysis that enhanced our alignment with both international sustainability frameworks. Our 2022 climate-related disclosure is part of the MD&A in our Integrated Report and is structured as per the TCFD recommendations (see alignment table on page M96 of our 2022 Integrated Report).

TransAlta monitors and reports on 80+ sustainability performance metrics, including the reporting year and two trailing years for cross comparison. Climate-related metrics include resource or energy use, GHG emissions and air emissions, which are verified by 3rd party auditors. GHG emissions data for scopes 1 and 2 follow the accounting and reporting standards of the GHG Protocol. We adopt guidance from the Global Reporting Initiative ("GRI") and Sustainability Accounting Standards Board ("SASB") requirements for 'Electric Utilities and Power Generators'.

In 2022, TransAlta disclosed 19 sustainability targets in support of the United Nations Sustainable Development Goals ("UN SDGs") and the Future-Fit Business Benchmark, of which four are related to climate change. TransAlta is committed to decarbonizing our energy generation and to accelerating clean energy growth. We believe we can make a greater positive impact on UN SDG 7 "Affordable and Clean Energy" and SDG 13 "Climate Action", while supporting several other SDGs. Progress towards our climate-related targets is disclosed using qualitative and quantitative data (percentage of target met).

C12.5

(C12.5) Indicate the collaborative frameworks, initiatives and/or commitments related to environmental issues for which you are a signatory/member.

	Environmental collaborative framework, initiative and/or commitment	Describe your organization's role within each framework, initiative and/or commitment
Row 1	We Mean Business Other, please specify (Powering Past Coal Alliance)	In 2021, TransAlta approved a more stringent climate-related target to reduce 75 per cent of our scope 1 and 2 GHG emissions by 2026 from a 2015 base year. In addition, we became the first publicly traded Canadian electricity company to commit to GHG emissions reduction targets through the Science Based Targets initiative ("SBTi"). As a result, we became a member of the We Mean Business Coalition, which catalyzes business and policy action to halve emissions by 2030 and accelerate an inclusive transition to a global net-zero economy by 2050. During COP26 in 2021, TransAlta became a member of the Powering Past Coal Alliance, which is a coalition of national and subnational governments, businesses and organisations working to advance the transition from unabated coal power generation to clean energy. To date, we have retired 4,664 MW of coal-fired generation capacity since 2018 while converting 1,659 MW to natural gas. Comparatively, our converted natural gas units' CO2 intensity is approximately 57 per cent less than coal generation. Repurposing the facilities rather than decommissioning them reduces the cost and emissions associated with new construction and aligns with the UN SDGs, specifically "Goal 9: Industry, Innovation and Infrastructure." The completed conversions and the closure of the Highvale coal mine also contribute to the goals of Powering Past Coal Alliance.

C15. Biodiversity

C15.1

(C15.1) Is there board-level oversight and/or executive management-level responsibility for biodiversity-related issues within your organization?

	Board-level oversight and/or executive management-level responsibility for biodiversity-related issues	Description of oversight and objectives relating to biodiversity	Scope of board-level oversight
Row 1	Yes, both board-level oversight and executive management-level responsibility	TransAlta's Governance, Safety and Sustainability Committee ("GSSC") assists the Board in fulfilling its oversight responsibilities with respect to the Company's monitoring of environmental regulations, public policy changes and the development of strategies, policies and practices for the environment. In 2022, the GSSC approved 2023 and beyond sustainability targets in the areas of climate change, biodiversity and supply chain (2023 Management Proxy Circular, page 61). Our new biodiversity targets are: (i) By 2024, assess and disclose nature-related risks and opportunities including TransAlta's dependencies and impacts on ecosystems, land, water and air; and (ii) Achieve zero biodiversity-related incidents. We estimate these targets support our sustainability goal of protecting nature and biodiversity as well as the intent of the the Taskforce on Nature-related Financial Disclosures ("TNFD") recommendations and the UN SDG 15: Life on land.	<Not Applicable>

C15.2

(C15.2) Has your organization made a public commitment and/or endorsed any initiatives related to biodiversity?

	Indicate whether your organization made a public commitment or endorsed any initiatives related to biodiversity	Biodiversity-related public commitments	Initiatives endorsed
Row 1	Yes, we have made public commitments and publicly endorsed initiatives related to biodiversity	Commitment to not explore or develop in legally designated protected areas Commitment to respect legally designated protected areas Commitment to avoidance of negative impacts on threatened and protected species Other, please specify (In 2022 TransAlta approved two new biodiversity targets that support the intent of the Taskforce on Nature-related Financial Disclosures ("TNFD") recommendations and the UN SDG Target 15 Life on Land.)	SDG

C15.3

(C15.3) Does your organization assess the impacts and dependencies of its value chain on biodiversity?

Impacts on biodiversity

Indicate whether your organization undertakes this type of assessment

Yes

Value chain stage(s) covered

Upstream
Downstream

Portfolio activity

<Not Applicable>

Tools and methods to assess impacts and/or dependencies on biodiversity

Biodiversity indicators for site-based impacts

Please explain how the tools and methods are implemented and provide an indication of the associated outcome(s)

i) Assessing biodiversity impacts of our value chain: We consider the biodiversity impacts at all of our existing operations and the biodiversity impacts of all new growth projects are evaluated in line with regulatory compliance and with respect to TransAlta's focus on biodiversity health. Details on how we assess biodiversity impacts of our value chain are presented in the sections below.
ii) Example of assessment in growth: Each new TransAlta development project must complete an in-depth environmental assessment (as prescribed by the local regulation and in line with our own assessment practices) describing baseline environmental conditions, identifying potential effects and developing mitigation strategies for identified environmental sensitivities prior to construction and operation. These assessments have been specifically designed to meet the environmental information requirements of the respective regions in which we operate while identifying alignment with the intent of the standards and/or regulations applicable to these jurisdictions. Typically, our renewable projects are greenfield development sites that require a higher level of evaluation compared to our gas projects, which usually integrate into existing industrial facilities. In addition, each greenfield development project has a detailed community engagement plan designed to ensure all potentially impacted host landowners, stakeholders, agencies, businesses, non-governmental organizations ("NGOs"), environmental NGOs and Indigenous communities understand the nature of the projects, have multiple and varied opportunities for engagement and feedback and are able to engage in meaningful dialogue and discussion with TransAlta and its representatives. The ultimate goal is addressing, resolving and mitigating stakeholder or Indigenous community concerns prior to filing major permit applications for all of our projects.
iii) Example of assessment in our day-to-day operations: At our Alberta operations, in 2022, we continued with our Wildlife Monitoring Program designed to monitor wildlife abundance and species diversity in the study area over time. Based on these surveys, TransAlta has seen primarily stable or increasing biodiversity in the areas of our facilities, with various new bird species being detected over the years and incidents of vehicle collisions decreasing due to lower speed limit restrictions.

Dependencies on biodiversity

Indicate whether your organization undertakes this type of assessment

No, but we plan to within the next two years

Value chain stage(s) covered

<Not Applicable>

Portfolio activity

<Not Applicable>

Tools and methods to assess impacts and/or dependencies on biodiversity

<Not Applicable>

Please explain how the tools and methods are implemented and provide an indication of the associated outcome(s)

<Not Applicable>

C15.4

(C15.4) Does your organization have activities located in or near to biodiversity- sensitive areas in the reporting year?
Yes

C15.4a

(C15.4a) Provide details of your organization's activities in the reporting year located in or near to biodiversity -sensitive areas.

Classification of biodiversity -sensitive area
UNESCO World Heritage site

Country/area
Canada

Name of the biodiversity-sensitive area
Canadian Rocky Mountain Parks

Proximity
Adjacent

Briefly describe your organization's activities in the reporting year located in or near to the selected area
TransAlta operates two hydro power systems (total of 196 MW) adjacent to Banff National Park - Canada's first national park and the flagship of the nation's park system. Banff is part of the Canadian Rocky Mountain Parks UNESCO World Heritage Site. Our Kananaskis River System is part of the Bow River Electric System in Alberta and includes three hydro facilities: Interlakes (5 MW, approx. 8,500 MWh/year), Pocaterra (15 MW, approx. 29,000 MWh/year) and Barrier (11 MW, approx. 40,000 MWh/year). Our Interlakes facility provides water storage on Upper Kananaskis Lake and generates power from the head between the Upper and Lower Kananaskis Lakes. The head is the vertical distance the water falls to the turbines, which rotate to create an electric current. Our Pocaterra facility, located in Peter Lougheed Provincial Park, generates power by diverting water from the Lower Kananaskis Lake to turn a turbine. The water is all returned to the Kananaskis River downstream of the facility. Our Barrier hydro facility created the Barrier Lake Reservoir. The reservoir has a relatively small storage capacity; hence, Barrier is considered a run-of-the-river facility. Our Spray River System is also part of the Bow River Electric System in Alberta and includes three hydro facilities: Three Sisters (3MW, approx. 4,200 MWh/year), Spray (112 MW, approx. 210,000 MWh/year) and Rundle (50MW, approx. 73,000 MWh/year). The Three Sisters facility controls the release water from the Spray Lakes Reservoir. Water from the Three Sisters facility flows downstream to the Spray Facility and the Rundle Facility before finally discharging to the Bow River at the Rundle powerhouse.

TransAlta's hydro facilities primarily provide electricity during periods of peak electrical demand and ensure system stability. Their operating flexibility means they can start quickly to introduce hydro power within minutes, balancing out shortages due to unexpected outages, or providing power at times of high demand. We operate and own 100 per cent of these facilities, which are Ecologo certified (except for the Three Sisters facility). This means our energy products or services have undergone third-party testing for reduced impacts on aquatic, riparian and terrestrial ecosystems.

Indicate whether any of your organization's activities located in or near to the selected area could negatively affect biodiversity
Yes, but mitigation measures have been implemented

Mitigation measures implemented within the selected area
Scheduling
Physical controls
Operational controls

Explain how your organization's activities located in or near to the selected area could negatively affect biodiversity, how this was assessed, and describe any mitigation measures implemented
i) Description of how our activities could negatively affect biodiversity: At our hydro facilities a major focus is on reducing the potential adverse effects on fish and fish habitat. Water level fluctuations can alter fish behaviour, distribution and growth. For example, flooding can physically alter riparian areas by scouring banks, cutting new channels, and by redistributing organic matter, sediments and aquatic organisms. Conversely, fishes in stable high-water systems frequently have better growth and reproduction success than those in low water or fluctuating systems. Therefore, operational controls are implemented to ensure continuous and stable flows are maintained. Fish and fish habitat are important for biodiversity and protected by legislation. For our Kananaskis River System, at the provincial level, we engage with the Alberta's Ministry of Environment and Protected Areas and at the federal level, with Fisheries and Oceans Canada. ii) Description of mitigation measures implemented: Case study. Situation: TransAlta works closely with the government of Alberta to operate our Kananaskis River System safely and responsibly. For example, leveraging existing infrastructure is an effective option to help protect communities along the Bow River. Task: In 2021, the Alberta government extended TransAlta's Modified Operations Agreement for another 5-year term. This allows the government to modify operations at several TransAlta facilities to help protect communities along the Bow River against the impacts of floods and drought, which could negatively affect fish habitat. Action: Our operations include (i) modified operations period at Ghost Reservoir from May 16 to July 7, primarily for flood mitigation purposes; and (ii) year-round modified operations at Barrier Lake, Upper Kananaskis Lake and Lower Kananaskis Lake, primarily for drought mitigation purposes. Result: The Modified Operations Agreement with TransAlta helps us manage water on the Bow River at our Ghost Reservoir facility for flood mitigation efforts and at our Kananaskis River System for drought mitigation effort. The use of thresholds can help minimize or avoid negative impacts to the environment, particularly fish, from winter water withdrawal activities.

Classification of biodiversity -sensitive area
UNESCO World Heritage site

Country/area
Canada

Name of the biodiversity-sensitive area
Canadian Rocky Mountain Parks

Proximity
Overlap

Briefly describe your organization's activities in the reporting year located in or near to the selected area
TransAlta's Cascade hydro power facility (36 MW) is located on the Cascade River within Banff National Park - Canada's first national park and the flagship of the nation's park system. Banff is part of the Canadian Rocky Mountain Parks UNESCO World Heritage Site. Cascade is the only power development in a Canadian national park.

TransAlta bought the Cascade facility from the Canadian federal government in 1941. The following year, TransAlta built a new dam and power facility to replace the original. We added a second generating unit in 1957. The construction of the dam resulted in the creation of Lake Minnewanka as a storage reservoir, 4km upstream.

Water is supplied to the facility via a canal from Lake Minnewanka, with the water discharging from the facility to the lower Cascade River which flows into the Bow River. The facility includes two 17 MW power generating units producing 52,000 MWh/year on average. Cascade is a peaking facility which ramps up and down as dictated by power demand and water supply. Typical daily power facility operation includes several hours online and several hours offline which may consist of either one or both units operating. We operate and own 100 per cent of this facility.

The Cascade facility is Ecologo certified. This means our energy products or services have undergone third-party testing for reduced impacts on aquatic, riparian and terrestrial ecosystems. Protection of the environment is an important part of our hydro power business, as is responsible water use. We continually work with environmental and community groups to ensure habitats are protected and that all users' needs are heard.

Indicate whether any of your organization's activities located in or near to the selected area could negatively affect biodiversity
Yes, but mitigation measures have been implemented

Mitigation measures implemented within the selected area
Scheduling
Physical controls
Operational controls

Explain how your organization's activities located in or near to the selected area could negatively affect biodiversity, how this was assessed, and describe any mitigation measures implemented
i) Description of how our activities could negatively affect biodiversity: At our hydro facilities a major focus is on reducing the potential adverse effects on fish and fish habitat. Water level fluctuations can alter fish behavior, distribution and growth. For example, flooding can physically alter riparian areas by scouring banks, cutting new channels and by redistributing organic matter, sediments and aquatic organisms. Conversely, fishes in stable high-water systems frequently have better growth and reproduction success than those in low water or fluctuating systems. Therefore, operational controls are implemented to ensure continuous and stable flows are maintained. Fish and fish habitat are important for biodiversity and protected by legislation. For river systems on which we operate, at the provincial level, we engage with the Alberta's Ministry of Environment and Protected Areas and at the federal level, with Fisheries and Oceans Canada. ii) Description of mitigation measures implemented: Case study. Situation: Our dam safety programs include all hydroelectric developments, constructed ponds and fluid retaining structures, as well as associated equipment and structures and the personnel required to operate, maintain and inspect these items. They are governed through our Dam Safety Policy and Dam Safety Management System, which includes requirements on design, modification and decommissioning, operation, maintenance and surveillance, public safety, emergency management and risk management. Task: In 2022, a member of the Board was designated as the Company's Dam Safety Advisor to assist the Board in fulfilling its oversight role regarding the Company's dam safety practices. TransAlta's Board and our CEO oversee the effectiveness of our dam safety programs and receive updates on this work. TransAlta also engages an external Dam Safety Review Panel to provide external review of the program and its management. Action: Our monitoring programs include: Regular operations and engineering inspections; Testing of critical equipment; Numerous instruments in the dams monitoring water level, temperature, movement; Use of drones and satellite remote movement monitoring; Emergency plans and exercises with internal and external stakeholders; and Regular third-party reviews that are shared with the regulators. Result: We work closely with local stakeholders including conservation authorities and public agencies on watershed management, emergency planning and flood response. For example, in 2021, the Alberta government extended its Modified Operations Agreement with TransAlta to manage water on the Bow River at our Ghost Reservoir facility for flood mitigation efforts and at our Kananaskis River System for drought mitigation efforts (see details above). The use of thresholds can help minimize or avoid negative impacts to the environment, particularly fish, from winter water withdrawal activities.

C15.5

(C15.5) What actions has your organization taken in the reporting year to progress your biodiversity-related commitments?

	Have you taken any actions in the reporting period to progress your biodiversity-related commitments?	Type of action taken to progress biodiversity- related commitments
Row 1	Yes, we are taking actions to progress our biodiversity-related commitments	Land/water protection Land/water management Species management Education & awareness

C15.6

(C15.6) Does your organization use biodiversity indicators to monitor performance across its activities?

	Does your organization use indicators to monitor biodiversity performance?	Indicators used to monitor biodiversity performance
Row 1	Yes, we use indicators	Pressure indicators Response indicators Other, please specify (Negative impacts to biodiversity are quantified/disclosed as 'Significant environmental incidents' in our Integrated Reports. Pressure/response indicators are disclosed in regulatory filings, e.g., bat mortality resulting from our wind operations.)

C15.7

(C15.7) Have you published information about your organization's response to biodiversity-related issues for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Report type	Content elements	Attach the document and indicate where in the document the relevant biodiversity information is located
In voluntary sustainability report or other voluntary communications	Content of biodiversity-related policies or commitments Governance Impacts on biodiversity	TransAlta's 2022 Integrated Report provides biodiversity-related information, as follows: 2023+ targets (page M74), governance (page M110) and assessments (page M111). 2022.12.31-TAC-Annual-Report-Final.pdf 2022.12.31-TAC-Annual-Report-Final.pdf

C16. 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.

C16.1

(C16.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Executive Vice President, Legal, Commercial and External Affairs	Other C-Suite Officer

Submit your response

In which language are you submitting your response?
English

Please confirm how your response should be handled by CDP

	I understand that my response will be shared with all requesting stakeholders	Response permission
Please select your submission options	Yes	Public

Please confirm below
I have read and accept the applicable Terms