

**Module: Introduction****Page: Introduction****CC0.1****Introduction**

Please give a general description and introduction to your organization.

TransAlta Corporation (TSX: TA, NYSE: TAC), headquartered in Calgary, Alberta, is one of Canada's largest publicly traded power generators and marketers, and the sponsor and majority owner of TransAlta Renewables (TSX: RNW). TransAlta owns assets strategically positioned in Canada, the United States and Australia. The goal shared by our more than 2,200 employees is to provide reliable, competitive power to our customers in a responsible, sustainable way. We own, operate and manage a highly contracted and geographically diversified portfolio of 69 generating facilities that use a variety of fuels, including coal, natural gas, hydro, and wind.

Since 1911, we've supplied the electric power that has made progress and innovation possible in Alberta and beyond. At first, our growth was tied to the evolution of a province steeped in rich natural resources. More recently, we've powered industry, commerce, and community well-being across Canada, in the U.S., and Australia. Wherever we operate, we are committed to responsibly supplying reliable electric power to customers at an affordable cost; to investing in the local community; and to doing business in a manner that ensures our employees are safe and proud.

It's important to note that TransAlta is not a traditional vertically-integrated utility, but rather the company is focused on wholesale electricity generation and energy marketing in deregulated electricity environments.

We are competing in a capital-intensive, commodity-based industry that has long business cycles and it's a business where power plants routinely run for 50 years or more. That means when we plan, we're planning years, even decades, into the future. We were one of the first companies in Canada to make significant investments in wind power.

Here's what we have planned for the years ahead:

- Dedicate the majority of our planned growth capacity to renewable power sources like wind and hydro
- Maintain a singular focus on generation to satisfy the growing demand for clean, reliable and competitively-priced electricity
- Build on over a century of experience

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**CC0.2****Reporting Year**

Please state the start and end date of the year for which you are reporting data.

The current reporting year is the latest/most recent 12-month period for which data is reported. Enter the dates of this year first.

We request data for more than one reporting period for some emission accounting questions. Please provide data for the three years prior to the current reporting year if you have not provided this information before, or if this is the first time you have answered a CDP information request. (This does not apply if you have been offered and selected the option of answering the shorter questionnaire). If you are going to provide additional years of data, please give the dates of those reporting periods here. Work backwards from the most recent reporting year.

Please enter dates in following format: day(DD)/month(MM)/year(YYYY) (i.e. 31/01/2001).

Enter Periods that will be disclosed
Thu 01 Jan 2015 - Thu 31 Dec 2015
Wed 01 Jan 2014 - Wed 31 Dec 2014
Tue 01 Jan 2013 - Tue 31 Dec 2013

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**CC0.3****Country list configuration**

Please select the countries for which you will be supplying data. If you are responding to the Electric Utilities module, this selection will be carried forward to assist you in completing your response.

**Select country**

Select country
Canada
Australia
United States of America

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#### CC0.4

##### Currency selection

Please select the currency in which you would like to submit your response. All financial information contained in the response should be in this currency.

CAD (\$)

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#### CC0.6

##### Modules

As part of the request for information on behalf of investors, electric utilities, companies with electric utility activities or assets, companies in the automobile or auto component manufacture sub-industries, companies in the oil and gas sub-industries, companies in the information technology and telecommunications sectors and companies in the food, beverage and tobacco industry group should complete supplementary questions in addition to the main questionnaire.

If you are in these sector groupings (according to the Global Industry Classification Standard (GICS)), the corresponding sector modules will not appear below but will automatically appear in the navigation bar when you save this page. If you want to query your classification, please email [respond@cdp.net](mailto:respond@cdp.net).

If you have not been presented with a sector module that you consider would be appropriate for your company to answer, please select the module below. If you wish to view the questions first, please see <https://www.cdp.net/en-US/Programmes/Pages/More-questionnaires.aspx>.

Electrical

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#### Further Information

**Module: Management**

**Page: CC1. Governance**

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**CC1.1**

**Where is the highest level of direct responsibility for climate change within your organization?**

Board or individual/sub-set of the Board or other committee appointed by the Board

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**CC1.1a**

**Please identify the position of the individual or name of the committee with this responsibility**

TransAlta's Governance and Environment Committee (GEC) is a Board-appointed committee that reports directly to the Board of Directors (BoD), which includes our CEO and acts as an assisting body to the Board to help fulfill oversight responsibility with respect to environment, health and safety. In conjunction, the GEC and BoD hold the highest level of responsibility in regards to climate change policy and sustainability. P. Thomas Jenkins was the chair of the GEC Committee in 2015.

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**CC1.2**

**Do you provide incentives for the management of climate change issues, including the attainment of targets?**

Yes

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**CC1.2a**

**Please provide further details on the incentives provided for the management of climate change issues**

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
Chief Executive Officer (CEO)	Monetary reward	Emissions reduction project Emissions reduction target Efficiency project Efficiency target	74% of Dawn Farrell's (CEO) compensation is dictated by company performance which includes recognition for achievement of emission targets, renewable growth targets and transition from higher intensity fuels (coal) towards lower intensity (natural gas and renewables). A large portion of this performance incentive for 2015/2016 includes planning for the reduced life span of our coal-fired generation facilities in Alberta, Canada and Washington, USA.

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
		Behaviour change related indicator	
Environment/Sustainability managers	Monetary reward	Emissions reduction project Emissions reduction target Efficiency project Efficiency target Behaviour change related indicator	TransAlta's Sustainable Development (SD) team is not directly funded to invest in company sustainability initiatives. Instead, the SD team motivates other business units to incorporate and fund their own sustainability goals. SD helps to increase awareness and acceptance of climate change initiatives which results in increased allocation of capital from business units. The performance goals for the Sustainability Advisor (overlooking the technical team), are linked to the delivery of annual, publically-stated sustainability goals. Each year, multiple sustainability goals are set across the organization and progress reported in our Report on Sustainability. These goals are also reflected as incentive goals for a variety of Management staff. Measured deliverables include accuracy of emissions reporting and level of reporting (comprehensiveness, disclosure, reputation management achieved through successful submissions of CDP and the TransAlta Report on Sustainability).
All employees	Recognition (non-monetary)	Behaviour change related indicator	Employees are recognized company-wide for their efforts and achievements related to climate change initiatives through the volunteer based TransAlta Eco-Action Committee. The committee is co-chaired by the Director of Sustainable Development. Successful campaigns have included PC Monitor & Power-Off Program, and Greening of Office Supplies. Successful annual campaigns include Carbon Footprint Challenge, Bike to Work Day, EcoFair and community engagement/education
All employees	Recognition (non-monetary)	Emissions reduction project Emissions reduction target	TransAlta's corporate strategy involves reduction of coal generation (and increased cleaner coal generation) and growth in renewable and clean power generation, ultimately reducing GHG impact. Employees are encouraged to align with this strategy and seek out innovative solutions. Recognition of initiatives is put forth in the annual Report on Sustainability, in Communications pieces, channeled via our Media team and occasionally featured in local news
Chief Financial Officer (CFO)	Other non-monetary reward	Emissions reduction target Behaviour change related indicator	The CFO holds oversight responsibility of all investor relations and has the opportunity to bring investor-motivated environmental and sustainability priorities in front of the Board and senior management, as sustainability and climate change strategy are on the investor agenda.
Process operation managers	Monetary reward	Efficiency project	The Wind Operations Performance Reporting tool, created by our wind team, standardizes reporting for our wind fleet. Operations now knows their top 10 issues, currently valued around \$1 million in lost revenue. This innovative tool is not only new to TransAlta but new to the wind industry, as there is no off-the-shelf solution to this problem. Allowing us to quickly identify and prioritize potential maintenance issues and

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
			place a value on them gives TransAlta a significant competitive advantage.
Business unit managers	Recognition (non-monetary)	Other: Innovation/Leadership	TransAlta President's Awards are given for Innovation and Environmental Leadership (climate change related initiatives evaluated annually).
Energy managers	Monetary reward	Efficiency project Efficiency target	The TransAlta Operations Diagnostic Centre has a mandate to increase energy output from existing renewable assets and optimize coal and gas assets. Employee short term incentives for this team are tied to meeting these goals within the calendar year.
All employees	Recognition (non-monetary)	Emissions reduction project	TransAlta partnered with Light up the World in 2015. An NGO focused on installing solar power systems in place of fuel burning in remote communities in developing nations. TransAlta offered all employees the opportunity to submit an essay and apply for a trip to Peru in 2015. TransAlta paid for the electrical and solar training, expenses (flights not included) and provided time off for successful employees. Employees were recognized company wide and in the local media.

#### Further Information

**Page: CC2. Strategy**

#### CC2.1

**Please select the option that best describes your risk management procedures with regard to climate change risks and opportunities**

Integrated into multi-disciplinary company wide risk management processes

#### CC2.1a

**Please provide further details on your risk management procedures with regard to climate change risks and opportunities**

Frequency of monitoring	To whom are results reported?	Geographical areas considered	How far into the future are risks considered?	Comment
Six-monthly or more frequently	Board or individual/sub-set of the Board or committee appointed by the Board	All operating and office locations: Canada, USA, Australia	> 6 years	We manage both physical and regulatory risks & opportunities associated with climate change. SD calculates and tracks GHG emissions from our thermal facilities monthly and reports to ops&finance for review. The SD team calculates and coordinates independent verifications of GHG offset credits from wind facilities. Quarterly the Managing Director, Carbon Transition presents to the Governance and Environment Committee of the Board on climate change risks and opportunities. Yearly, the SD team prepares the CDP submission by collecting information from across the organization. SD also project manages the Integrated Report, combining sustainability disclosure within our annual financial disclosure, which is submitted to the GEC. The preparation of these reports involves direct engagement with stakeholders across the company. The engagement with the business units to help them understand climate change, risks and opportunities, and integrate sustainability with their business practices.

## CC2.1b

### Please describe how your risk and opportunity identification processes are applied at both company and asset level

Company: By tracking environmental performance associated with climate change, reviewing regulatory changes, complying with regulations and keeping abreast of best practice, our business units assess risks, which are presented to business unit Managing Directors and in turn presented to the Governance and Environment Committee, which is responsible for forecasting and reviewing risk associated with climate change. The Audit and Risk Committee (ARC) of the Board also holds responsibility for identification of corporate risk (of all types to all business units) and managing procedures to mitigate risk. Furthermore, our BoD looks for business opportunities in line with company strategy, to create value for shareholders, shift away from conventional coal, introduce clean energy generation and look for innovative business solutions.

Asset: TransAlta assesses technical and operational risk through the Engineering and Technical Services team for all generation assets. Maintenance plans and sustaining capital are set aside to meet predetermined operating risk. Risks are evaluated at a business unit level, and the list of potential risks specific to each generation type is reviewed by the risk management team, GEC, ARC and BoD. Implementation includes forecasted risk associated with industry standards, best practice, and anticipation of regulatory and physical changes, and integrates it throughout the company in a top-down fashion where facility managers can use risk and opportunity frameworks to optimize operations. TransAlta places high importance on industry discourse facilitated through trade associations to uncover potential risk and opportunity. TransAlta assesses regulatory-based risk and opportunity to assets through the use of an internal carbon price, which acts as a mechanism to help anticipate the effect of emerging environmental policy on assets (and which assets will benefit, become disadvantaged, what technologies will become more or less relevant).

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**CC2.1c****How do you prioritize the risks and opportunities identified?**

Risk & opportunity are assessed as a function of enhancing long-term shareholder value through consistent operations & cash flow, meeting our return on capital thresholds, & through careful weighting of the likelihood of events against our risk tolerance. TransAlta employs an integrated approach to driving long-term shareholder value through 3 objectives: (1) optimizing base business: re-contracting to stabilize cash flows & extend asset life, continuously managing operating & fuel costs, maintaining strong availability across the fleet, prudently & rigorously managing sustaining capital expenditures, positioning the Canadian coal fleet to capture significant upside post PPA (power purchase arrangement); (2) investing in profitable growth: achieving growth through acquisitions & greenfield projects, ensuring disciplined returns & leverage, targeting markets of strong fundamentals & growth opportunities, focusing on gas & renewable generation (primarily contracted opportunities); (3) delivering sustainable dividend and maintaining financial strength: a competitive pay-out ratio with excess cash flow for growth, a strong balance sheet & investment-grade credit rating, access to multiple sources of capital.

To optimize & protect shareholder value as it relates to climate change issues, TransAlta focuses on both regulatory & physical risks. Physical risks are identified by operational groups through asset specific plans (e.g. TransAlta's Hydro Emergency Response Guide) while regulatory risks are tracked & reported by the SD group and our regulatory group. Risks are prioritized by probability and potential size of their impact. Regulatory climate change risks are more easily quantified financially, given that TransAlta incorporates carbon pricing in its long-range planning. In recognition of the climate change regulatory risks, asset growth plans are focused on the retirement of conventional-coal & investments in renewable energy & natural gas-fired generation.

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**CC2.1d**

Please explain why you do not have a process in place for assessing and managing risks and opportunities from climate change, and whether you plan to introduce such a process in future

Main reason for not having a process	Do you plan to introduce a process?	Comment
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**CC2.2**

**Is climate change integrated into your business strategy?**

Yes

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## CC2.2a

### **Please describe the process of how climate change is integrated into your business strategy and any outcomes of this process**

i. Business strategy: to remain a financially viable low cost producer of electricity to the communities we serve.

Climate change is integrated into business strategy through incorporation of identified climate change risks & opportunities, climate change strategy, & carbon pricing. All of these are recognized in the annual TransAlta ("TA") long and medium range forecasting processes. Related to climate change, regulatory risk/compliance (coal electricity generation), physical risks (hydro & drought/floods) & monetary opportunities (gas & renewable electricity generation) are the main drivers of integration into business strategy. E.g., regulatory risk surrounding coal electricity generation has led to TA implementing a phase out of coal plants, & in the interim has focused on tracking/monitoring/reporting/reducing emissions associated with coal electricity generation.

Aligned with our business strategy is our climate change strategy, which is implemented & managed on a corporate-wide business unit level, consisting of four main areas of focus (no particular order): 1) Energy efficiency improvements; 2) Development of emissions offsets portfolios to achieve emissions reductions at competitive costs; 3) Development of clean combustion technologies; 4) Growth of our renewables portfolio as an increasing component of our total generation portfolio.

TA attributes regionally specific carbon pricing, both currently & anticipated, as a mechanism to manage future risks pertaining to uncertainty in the carbon market, & as a safeguard to anticipate future impacts of regulatory changes on facilities. It is also a method of modelling for future electricity prices, & to analyze the viability of acquisitions.

ii. The most significant aspects that have influenced the strategy:

-Federal & state command/control & market-based regulatory frameworks, such as Alberta Specified Gas Emitters Regulation (SGER), Cdn Federal GHG reduction targets & fixed emissions caps for air pollutants, as well as more stringent performance standards for new and old coal facilities in the US.

-Offsets incentives: TA, through the SGER creates ~500,000 tonnes of emissions credits/year from our wind fleet. Also through SGER compliance obligations, TA contributes nearly 2 MT of purchased fund credits to Alberta projects focused on emissions reductions technology.

-Development of green business: a strong renewables portfolio will position us ahead of competitors when considering risk related to carbon regulations & caps, & the uncertainty of the price of carbon & its impact on coal-fired facilities (highlighted by our 1,050 MW wind capacity).

-Reputation management: transparency becomes paramount for public/customers/stakeholder/shareholder/investors, as sustainability & emissions reductions are of interest to investor groups. Modes of reputation management such as the CDP & Integrated Report are completed by the SD team.

iii. Key aspects of TA's short-term strategy: grow gas & renewables business in core markets. Growth is focused on gas & renewables because a commitment has been made to retire existing coal fleet (TA committed to reducing emissions from coal by 20% by 2021, and 55% by 2030; 2005 benchmark). Coal units, specifically Sundance 1 and 2 in Alberta, Canada & Centralia Unit 1 in Washington US will be retired by 2020 end. Near-term regulatory changes will have a significant impact on TA's business strategy because more stringent GHG performance standards for new & existing coal facilities require significant operational changes. Coupled with an increased price of carbon, it will become less economically viable to continue with coal-fired generation. The most important components of the short term strategy are: 1) enhancing our renewables & natural gas fleet (building now for the long-term); 2) managing the coal facility retirement plan; 3) enhancing our offset portfolio.

iv. Medium term (2020 to 2029): we will implement the most significant transition from conventional coal MW generation (Sundance 3-6, Keephills 1/2, & Centralia 2). It will mean a continued focus on natural gas fired & renewable energy to grow & replace lost capacity. In the long term (2029 to 2061) TA will have phased out completely the current fleet of conventional coal plants. The strategic growth focus on natural gas-fired & renewable generation over this time period will allow TA to realize a 7.2 million tonne reduction in annual coal related greenhouse gas emissions by 2021. By 2030 the annual reductions will increase to 32.2 million tonnes.

v. Operating Canada's largest wind fleet & a growing renewables fleet gives us a competitive edge in terms of not just clean generation supply, but also the ability to leverage a renewables-heavy brand, highlighted by the launch of TA Renewables in 2013. TA has 100 years of experience, & our longevity translates into our ability to plan a strategic, long-term sustainability framework. Moving forward, we will utilize our renewables portfolio as a hedge against future regulatory uncertainty. Over time, TA will incur less & less of a financial burden from GHG emissions. We recognize that renewable & clean energy is a responsible & viable business decision. TA was prudent & innovative in the development & implementation of the Operations Diagnostic Centre (ODC), a centralized monitoring centre running comprehensive computer diagnostics & analytics of field operations for both reliability & efficiency issues. The wind assets are notified proactively by the ODC of any equipment/mechanical malfunctions which allows the wind assets to maximize their output by running at maximum efficiency, full capacity, & preventing unnecessary outage time. In 2013, these analytics provided field staff with the information required to capture gains of ~1 full percent of the wind fleet output by flagging issues with wind plant control system tuning & early detection of equipment malfunction. TA is applying & expanding this analysis across the balance of wind farms to identify similar opportunities to increase productivity of the wind fleet.

vi. Most substantial business decisions of 2015:

-continued development of a combined cycle high efficiency natural gas facility in northern Western Australia. Help to meet demand in this region and reduce emissions intensity profile

-Completed construction of a natural gas pipeline to our Solomon power station. The pipeline has significantly reduced the plant's emission profile (previously operating on diesel).

-Restructured our contractual arrangements at the Poplar Creek facility, which included acquiring two wind facilities, representing 65 MW

-We acquired 71 MW of fully contracted renewable generation assets for cash consideration of \$106 million. The assets include our first solar facilities, representing 21 MW of capacity in Massachusetts, and one 50 MW wind farm in Minnesota.

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## CC2.2b

Please explain why climate change is not integrated into your business strategy

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## CC2.2c

**Does your company use an internal price of carbon?**

Yes

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**CC2.2d****Please provide details and examples of how your company uses an internal price of carbon**

- TransAlta evaluates all internal business decisions specific to the jurisdictions in which we operate
- Where a jurisdiction has a clear carbon regulatory framework in place, or a clearly stated policy plan, we use that as the planning tool,
- In other jurisdictions where there is less clarity, we apply scenario analysis to an effective carbon price to guide decisions.
- We currently pay \$20 a tonne for emissions over and above our baseline in Alberta as part of the SGER regulation. This is scheduled to increase to #30\$ in 2017+. We model carbon price estimates at approximately \$30 a tonne for facilities where we have obligations, as we do anticipate the price rising in the future.
- While we do produce offset credits from our wind facilities, we do not include full-price modeling in budget calculations as the primary driver for wind facilities is their electrical generation, not their offset generating potential.
- We currently purchase carbon credits at market value in the California WCI Cap and Trade System, and we have begun modeling our Ontario potential obligations under this system as well.

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**CC2.3****Do you engage in activities that could either directly or indirectly influence public policy on climate change through any of the following? (tick all that apply)**

Direct engagement with policy makers  
Trade associations  
Funding research organizations  
Other

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**CC2.3a****On what issues have you been engaging directly with policy makers?**

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
Cap and trade	Support with minor exceptions	Responding to a consultation and directly engaged with policy makers	On April 13, 2015, the Ontario government announced that Ontario will be implementing a GHG cap-and-trade system in an effort to reduce emissions and fight climate change. The cap-and-trade system will impose a hard ceiling on the GHG emissions allowed in each sector of the

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
			economy. The details of the cap-and-trade system (such as specifics on a potential cap, covered sectors, or anticipated launch date) have not been determined but are to be developed through stakeholder consultations. Our contracts at Gas facilities in the province generally include provisions protecting us from adverse changes in laws.
Cap and trade	Support	Responding to a consultation and directly engaged with policy makers	On Nov. 22, 2015, the Government of Alberta announced its Climate Leadership Plan. That Plan established several environmental and energy targets for Alberta, including: the phase-out of emissions from coal-fired generation by 2030; the replacement of two-thirds of the retiring coal-fired generation with renewable generation and one-third with gas generation; □ the objective of achieving up to 30 percent of Alberta's electricity production from renewables by 2030; and maintaining reliability, reasonable prices to customers and businesses, and ensuring capital is not unnecessarily stranded. The Province of Alberta will develop its associated regulations as well as a compensation plan for coal units in 2016. We will negotiate with the Government of Alberta, using a principles-based approach, to ensure the Corporation has the certainty and capacity needed to invest in clean power.
Carbon tax	Support	Active market participant.	In Australia, the Senate recently passed amendments to the country's Renewable Energy Target Scheme. The scheme was initially introduced in 2001 with three objectives: to establish a mandatory renewable energy target to be achieved in 2020; to provide incentives for large-scale renewable energy generators in the form of one large-scale generation certificate earned for each MWh of generation; and to require retailers and wholesale industrial customers to purchase a specified volume of their electricity from large-scale renewable-sourced electricity or incur a penalty of AUD\$65/MWh on any shortfall. The amendments reduced the annual targets for large-scale renewable sourced electricity down from 41,000 GWh in 2020 to 33,000 GWh in 2020, held constant at this level until 2030. It is estimated that this will require an additional 5,000-6,000 MW of new capacity to be installed to add to the slightly more than 4,000 MW already operating. Since the Australian assets are fully contracted it is not expected that these amendments will have a significant impact.
Clean energy generation	Support with minor exceptions	Member of caucus.	In collaboration with the Canadian Wind Energy Association, TransAlta supported policies encouraging wind energy development, and participated in the discussion of a Clean Electricity Standard for the Alberta market.
Cap and trade	Support with minor exceptions	Signed TransAlta Energy Bill to support phase out of coal and promote energy efficiency	On Aug. 3, 2015, President Obama announced the Clean Power Plan. The plan sets GHG emission standards for new fossil-fuel-based power plants and emission limits for individual states. States will have the option of interpreting their limits in mass-based (tons) or rate-based (pounds per megawatt hour) terms. The plan is intended to achieve an overall reduction in GHG emissions of 32 per cent from 2005 levels by 2030. It will be implemented in two stages: 2022 to 2029, and 2030 and beyond. On Dec. 17, 2014, Washington State Governor Jay Inslee released a carbon-emissions reduction program for the State, where our U.S. Coal plant is located. Included in this program are a cap-and-trade plan and a low-carbon fuels standard. The proposed emissions cap will become more stringent over time, providing emitters time to transition their operations. These additional regulations for existing power plants are not

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
			<p>expected to significantly affect our U.S. operations. TransAlta has agreed with Washington State to retire units in 2020 and 2025. This agreement is formally part of the State's climate change program. We believe that there will be no additional GHG regulatory burden on U.S. Coal given these commitments. The related TransAlta Energy Bill was signed into law in 2011 and provides a framework to transition from coal to other forms of generation.</p>

**CC2.3b**

**Are you on the Board of any trade associations or provide funding beyond membership?**

Yes

**CC2.3c**

**Please enter the details of those trade associations that are likely to take a position on climate change legislation**

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
Canadian Clean Power Coalition	Consistent	<p>The CCPC, consisting of leaders in Canadian and US electricity generation, believes that coal, along with a diverse mix of renewables and alternative fuels such as wind, hydro, natural gas, nuclear and solar will be crucial in meeting future energy needs. The mandate of the CCPC is to research and develop financially viable technologies that will reduce the environmental impact of coal. The primary objective of the CCPC is to continue to utilize coal-fired generation and demonstrate how it can address environmental (including CO2) issues. The CCPC presents findings to government to attempt to influence public policy, ensuring that it aligns with the coalition's mandate (presenting the future of coal as a clean, environmentally and financially viable energy source). The CCPC is currently undertaking Phase 5 of its study on emerging technologies to help reduce coal plant emissions. Phase 5 focuses on both retrofit and greenfield modelling, analyzing existing technology that could apply. Short-term technologies include coal beneficiation, biomass co-firing, and low pressure oxy-fuel. Longer term strategy explores "game-changing" technologies such as post-</p>	<p>Yes, TransAlta chairs the organization.</p>

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
		combustion membranes and advanced oxy-fuel.	
Canadian Wind Energy Association	Mixed	CanWEA is a non-profit representative of the Canadian wind industry, who through advocacy, education, communications, partnerships, networking and the promotion of best practices, represents its members in communication with the public, government and other stakeholders, aiming to ensure the growth and prosperity of Canadian wind energy. CanWEA believes that wind energy is a major part of the solution for reducing Canadian GHG emissions. The organization hosts conferences and networking events for members. TransAlta's position differs slightly in that the Company does not believe that the wind energy sector requires heavy government subsidy.	Yes, TransAlta sits on the Board.
Canadian Electricity Association	Consistent	The CEA advocates for rational climate change policy with the Canadian federal government as it relates to the electricity sector.	Yes, TransAlta sits on the Board.
Independent Power Producers Society of Alberta	Consistent	IPPSA offers a forum for Alberta's power producers to generate policy positions representing the interests of membership with government and stakeholders. IPPSA is a strong proponent of competitive market principles, allowing the market to determine the most appropriate types of energy generation. As Alberta shifts from coal to natural gas and renewables, IPPSA advises government on policy changes while representing the interests of its members.	Yes, TransAlta sits on the Board.

**CC2.3d**

**Do you publicly disclose a list of all the research organizations that you fund?**

Yes

**CC2.3e**

**Please provide details of the other engagement activities that you undertake**

We engage as appropriate with government, policy makers, customers, and peer groups as requested or as required. As a company with a long Canadian history we are well positioned to bring our knowledge and expertise to new and developing areas (such as emissions management, low carbon generation and cap and trade, among others). TransAlta also supports numerous NGOs in various capacities, such as the Public Policy Forum, Canada West Foundation, Edison Electric Institute and the Excel Group

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**CC2.3f**

**What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?**

Consistency of messaging is assured through organizational structure. The Managing Director, Carbon Transition is responsible for policy advocacy and also for updating the Board and senior executive team regarding emerging issues and TransAlta positions. Managing Director, Carbon Transition along with CEO communicate engagement and activities internally, engaging all senior management stakeholders ensuring that their external activity and the outward company image is in line with company (internal) growth strategy. TransAlta also provides transparency to these activities with shareholders being made aware of environmental priorities through the "Environmental and Local Communities Capital" sections of the integrated report. The Managing Director, Carbon Transition also acts as a liaison between TransAlta and various trade organizations (such as chairing the board of CCPC).

Trickle-down effect: GEC and BoD set out strategic business plan. Managing Director, Carbon Transition advises on current industry best practice, strategy and external initiative alignment. All enrolments in organizations and policy-influencing activity are reviewed through top-down oversight.

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**CC2.3g**

**Please explain why you do not engage with policy makers**

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**Further Information**

**Page: CC3. Targets and Initiatives**

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**CC3.1**

**Did you have an emissions reduction or renewable energy consumption or production target that was active (ongoing or reached completion) in the reporting year?**

Absolute target  
Intensity target

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**CC3.1a**

**Please provide details of your absolute target**

ID	Scope	% of emissions in scope	% reduction from base year	Base year	Base year emissions covered by target (metric tonnes CO2e)	Target year	Is this a science-based target?	Comment
Abs1	Scope 1	86%	20%	2005	36029170	2021	No, but we anticipate setting one in the next 2 years	The 2015 Integrated Report describes TransAlta's GHG reduction target for coal. In 2019-2020 TransAlta will shutdown Sundance Unit 1 and 2, as well as 50% of coal operations at our Centralia plant in Washington, US. TransAlta intends to achieve a 20% reduction from 2005 coal-related GHG emission levels by 2021 or the equivalent of 7,200,000 tonnes CO2e per year.
Abs2	Scope 1	86%	50%	2005	36029170	2030	No, but we anticipate setting one in the next 2 years	The 2015 Integrated Report describes TransAlta's long-term GHG reduction target for coal. By year end 2030 TransAlta is targeting shutting down Sundance Unit 3-6 and Keephills Unit 1 and 2. Keephills 3, a newer and lower GHG intensity plant, will remain part of our power generation fleet. We will also shutdown coal operations at our Centralia plant in Washington, USA. Reflected in 2031 we expect to see a 90% reduction in CO2e emissions from coal power plant electricity generation. We expect this to be approximately a 19,700,000 CO2e metric tonnes reduction in emissions from coal fired electricity generation.

**CC3.1b**

**Please provide details of your intensity target**

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base year	Normalized base year emissions covered by target	Target year	Is this a science-based target?	Comment
Int1	Scope 2 (location-based)	56%	12%	Metric tonnes CO2e per megawatt hour (MWh)*	2003	24000000	2015	No, and we do not anticipate setting one in the next 2 years	Alberta requires facilities that emit more than 100,000 tonnes of greenhouse gases a year to reduce emissions intensity by 12 per cent year over year. There are several ways companies can comply: 1) Make improvements to their operations; 2) Purchase Alberta-based carbon offset credits; and/or 3) Contribute to the Climate Change and Emissions Management Fund. If a company that is covered by the Specified Gas Emitters Regulation reduces its emissions intensity to below its reduction target, it is eligible for an emission performance credit. Like offsets, these credits are used to counteract the emissions of a facility. Unlike offsets, these additional reductions occur at regulated facilities. Emission performance credits can be banked for future use or traded between facilities owned by the same company. They can also be registered with the Alberta Emission Performance Credit Registry. Once these credits are registered, they can then be purchased by other regulated companies that have not met their reduction target. Like carbon offsets, the cost for emission performance credits vary because it is market driven.

CC3.1c

Please also indicate what change in absolute emissions this intensity target reflects

ID	Direction of change anticipated in absolute Scope 1+2 emissions at target completion?	% change anticipated in absolute Scope 1+2 emissions	Direction of change anticipated in absolute Scope 3 emissions at target completion?	% change anticipated in absolute Scope 3 emissions	Comment
Int1	No change	12	No change	12	The annual intensity target is estimated to reduce scope 1 and 2 emissions over the long term, although annual reductions may vary depending on unit availability. Because of the nature of coal operations a 12% intensity reduction is very close to a 12% absolute emissions reduction. Our Scope 3 reductions reflect our investments that are also subject to the SGER.

CC3.1d

Please provide details of your renewable energy consumption and/or production target

ID	Energy types covered by target	Base year	Base year energy for energy type covered (MWh)	% renewable energy in base year	Target year	% renewable energy in target year	Comment
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CC3.1e

For all of your targets, please provide details on the progress made in the reporting year

ID	% complete (time)	% complete (emissions or renewable energy)	Comment
Abs1			TransAlta expects its % complete (emissions) to fluctuate based on availability of coal plants in the run up to 2020. It is important to note that a significant amount of TransAlta's generation is governed by Power Purchase Arrangements (PPA's) which give the Buyer of the PPA wide discretion regarding the dispatch of generation units – thus our ability to control emissions exactly is limited.
Abs2			TransAlta expects its % complete (emissions) to fluctuate based on availability and forecasted generation of coal plants in the run up to 2031. Past 2021 we expect to see a gradual increase in the % complete (emissions) number.
Int1	100%	100%	We must comply annually with the AB carbon intensity regulation on our facilities emitting more than 100,000 tonnes CO2e annually, which includes: Sundance (coal), Keephills (coal), Keephills 3 (coal) and Ft Sask (gas). We use a variety of compliance methods, as per the system, we reduce emissions annually, use offsets to reduce and pay in to the Alberta Clean Carbon technology fund (CCEMC). The annual intensity target is estimated to reduce scope 1 and 2 emissions over the long term, although annual reductions may vary depending on unit availability, and compliance may be achieved through means other than emissions reduction.

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**CC3.1f**

Please explain (i) why you do not have a target; and (ii) forecast how your emissions will change over the next five years

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**CC3.2**

**Do you classify any of your existing goods and/or services as low carbon products or do they enable a third party to avoid GHG emissions?**

Yes

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**CC3.2a**

Please provide details of your products and/or services that you classify as low carbon products or that enable a third party to avoid GHG emissions

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
Group of products	Renewable electricity generation	Avoided emissions	Other: Internal model	16%	Less than or equal to 10%	We generate renewable electricity for customers from a combination of hydro, wind and solar

### CC3.3

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

Yes

### CC3.3a

Please identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO2e savings

Stage of development	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	1	

Stage of development	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
To be implemented*	3	3743817
Implementation commenced*	4	497830
Implemented*	1	53260
Not to be implemented	0	

### CC3.3b

For those initiatives implemented in the reporting year, please provide details in the table below

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Low carbon energy installation	Gas pipeline	53260	Scope 2 (location-based)	Voluntary	30	172	4-10 years	16-20 years	

### CC3.3c

What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Compliance with regulatory requirements/standards	Alberta Carbon Markets (SGER), Australian carbon markets. More broadly, CEPA in Canada and EPA in the U.S.
Dedicated budget for low carbon product R&D	As laid out in our 2014 Report on Sustainability, page 58 - we dedicate cash flow to R&D annually (environment related) and have an internal group dedicated to evaluating new technology opportunities
Internal finance mechanisms	Created TransAlta Renewables (TRI) in 2013 to help generate cash flow for TransAlta, moved several assets into the TRI portfolio through 2014.
Partnering with governments on technology development	Recently participated in CCS project called Project Pioneer. Annual support and member of Canadian Clean Power Coalition.
Employee engagement	EcoAction Team- internal committee focused on raising awareness and engaging employees on sustainability issues. Eco-savings challenges, bike to work days, eco-fairs, etc.
Other	ROI - TransAlta assesses a lifecycle return on investment in comparison to alternative emissions reduction investments, either driven by opportunity or regulatory requirement.

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CC3.3d

If you do not have any emissions reduction initiatives, please explain why not

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**Further Information**

**Page: CC4. Communication**

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CC4.1

**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	Status	Page/Section reference	Attach the document	Comment
In mainstream reports (including an integrated report) but have not used the CDSB Framework	Complete	M13, M33, M34, M60, M62, 189	<a href="https://www.cdp.net/sites/2016/28/19328/Climate%20Change%202016/Shared%20Documents/Attachments/CC4.1/TransAlta_2015_Integrated_full_report.pdf">https://www.cdp.net/sites/2016/28/19328/Climate Change 2016/Shared Documents/Attachments/CC4.1/TransAlta_2015_Integrated_full_report .pdf</a>	Please review our integrated report for further details.
In voluntary communications	Complete	Website		<a href="http://www.transalta.com/sustainability/climate-change-action">http://www.transalta.com/sustainability/climate-change-action</a>

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#### Further Information

### Module: Risks and Opportunities

#### Page: CC5. Climate Change Risks

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##### CC5.1

**Have you identified any inherent climate change risks that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply**

- Risks driven by changes in regulation
- Risks driven by changes in physical climate parameters
- Risks driven by changes in other climate-related developments

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##### CC5.1a

Please describe your inherent risks that are driven by changes in regulation

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Other regulatory drivers	In September 2012, the Canadian Federal government finalized the "Reduction of Carbon Dioxide Emissions from Coal-Fired Generation of Electricity" regulations, which will require TransAlta coal-fired facilities to meet a GHG emissions standard equivalent to natural gas-fired power plants. There are as of yet no provincial coal phase out guidelines, which represent as risk to the company should new ones be	Reduction in capital availability	>6 years	Direct	Virtually certain	High	Under the regulations TransAlta will retire coal units over the next 15 years and achieve GHG reductions of some 55% of current emission levels by the end of 2029. At our Sundance coal facility 1 & 2 are scheduled to be shutdown in 2019 (715 MW). Approximately \$163 million in annual revenue or \$61 million in EBITDA reduction will begin from 2019+.	Environmental Canada already has a schedule for coal plant decommissioning, so we can leverage existing timelines as required with provincial regulators. We have been engaging with the Provincial government on the NOx and SO2 issues. In Alberta, the loss of coal fired generation to the grid would create a need to be replaced with new generation projects, in addition to what has already been in development to accommodate MW growth in Alberta. Production from remaining projects will be optimized	Replacing lost EBITDA will be partly achieved via low carbon greenfield development projects. TransAlta is currently building a 150 MW combined cycle natural gas generation facility in northern Western Australia. Cost of management is \$570 million (AUD), funded via a 25 year PPA (signed with Fortescue) and an equity offering by TransAlta Renewables. TransAlta has also recently received regulatory approval to build Sundance

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	introduced. In addition, provincial guidelines for Nox and Sox currently do not complement the federal Coal phase out regulation. This also presents a source of uncertainty.							and new projects will be developed through M&A activities and greenfield business development opportunities.. TransAlta has been shifting to a low carbon business centric model since 2000. The accelerated phase out of coal has accelerated our own development of low carbon assets. We also continue to explore clean solutions, such as CCS technology, coal to gas conversion, coal to biomass options. These options must fit our transition to a low carbon business centric model and make economic sense.	7, a 856 MW high efficiency combined cycle natural gas generation facility (0.36 emission intensity). Cost of management is approximately \$650 million (CAD). The project is currently on hold due to current uncertainty in carbon regulation decisions in the Alberta market. Financing details are not yet announced. Both projects are anticipated to add approximately \$90 million in EBITDA (CAD).
Cap and trade	TransAlta's Washington-	Increased operational cost	Up to 1 year	Direct	Virtually certain	Medium-high	Financial implications	Financial implications	Approx. 0.5 -1 FTE have been

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
schemes	<p>based Centralia facility sells some of its electricity into California. Due to the California cap and trade system and the high compliance complexity of California regulations and trading, the electricity imports from and trading opportunities for Centralia are reduced. Ontario recently announced their intention to join the California model cap and trade system, which we anticipate will affect 4 of our Ontario gas facilities.</p>						<p>include possible reduced generation and associated revenue at Centralia, and the incurred cost of purchases of California Carbon Allowances (will be a function of the market price - currently around \$13 a ton). In Ontario, our Co-Generation facilities have not been subjected to carbon pricing and there are uncertainties around how co-gen units will be treated (credit allocations are possible), and the starting year for</p>	<p>include possible reduced generation and associated revenue at Centralia, and the incurred cost of purchases of California Carbon Allowances (will be a function of the market price - currently around \$13 a tonne). In Ontario, our Co-Generation facilities have not been subjected to carbon pricing to date and there are uncertainties around how co-gen units will be treated (credit allocations are possible), and the starting year for compliance.</p>	<p>assigned to the Ontario file, and will be required for management of credits and allowances once that scheme is in place.</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							compliance.		
Product labelling regulations and standards	Potential for future regulations that will require green certification	Reduced demand for goods/services	>6 years	Direct	More likely than not	Medium	<p>A reduction in demand for our coal or gas fired generation could be significant. While it would be difficult to pinpoint an estimate, coal and gas currently makes up 75% of our generation capacity. Coal provided \$334M EBITDA and gas \$330M EBITDA in 2015. However, any decline in purchases of coal or gas could be offset by increased demand and higher pricing for wind and hydro assets. Costs</p>	We will be investing the bulk of our growth in renewables and lower carbon emission generation. We are well positioned to take advantage of new green legislation. We will ensure that any new renewable facilities are Eco-Logo certified, and as in the past we can market to customers our green portfolio.	Certifications do increase costs, time allocated to certifications and applying for certifications is estimated at: 20K-50K

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							estimated to be net neutral or only slightly negative.		
Uncertainty surrounding new regulation	Federal and provincial "equivalency agreements" would see GHG emissions regulations transfer from the federal to provincial domain. For Alberta to create an equivalent provincial regulatory framework to the current federal one would command a tightening of the SGER, resulting in an environmental benefit, but a financial and operational risk.	Increased operational cost	1 to 3 years	Direct	More likely than not	Medium-high	The current GHG regulation compliance costs range from \$30M to \$45M per year. New regulations would likely increase these costs. There is a real possibility that these regulations would cease our coal fired generation (earlier than currently dictated) which accounted for \$334 million of EBITDA in 2015. In addition, if we allocate capital to build replacement	Environmental Canada already has a schedule for coal plant decommissioning, so we can leverage existing timelines as required with provincial regulators. We have been engaging with the Provincial government on the NOx and SO2 issues. In Alberta, the loss of coal fired generation to the grid would create a need to be replaced with new generation projects, in addition to what has already been in development to accommodate MW growth in Alberta. Production from	TransAlta already has the M&A and BD expertise in place and the coal-decommission schedule has been in place for a couple of years. Should coal roll-off be accelerated, and new capital projects implemented, additional FTE of 3-4 (costs of 250-300K) would be expected on the management side.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							generation, additional costs (in the hundreds of millions) would be incurred.	remaining projects will be optimized and new projects will be developed through M&A activities and greenfield business development opportunities. We continue to explore CCS technology, coal to gas conversion, and renewable options for growth.	
Uncertainty surrounding new regulation	Regulatory changes such as increases in feed-in tariffs, shift towards localized grids, self sufficiency and energy storage.	Reduced demand for goods/services	>6 years	Direct	About as likely as not	Medium	TransAlta has a mix of large scale and small scale decentralized facilities. The impact would be to our large scale facilities, which go to the grid. We would likely see a mix of costs (on fossil fuel generation) and increased revenue in the case of a	We continually evaluate industry scale storage options, renewable storage options, and provide feedback to government on feed-in tariffs. We have experience in small scale behind the fence generation, which could capitalize on a move towards localized generation.	Approx. 0.10 FTE

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							renewable tariff (on our renewables) fossil fuel does make up the bulk of our generation (75%) and revenue (\$750M EBITDA).		
Other regulatory drivers	Washington State Senate Bill 5769 requires that the TransAlta Centralia facility shut down one coal-fired boiler in 2020 and the other in 2025. Agreements are in place with legislature to transition the facility to a natural gas plant by using some of the existing infrastructure, but there remains some uncertainty around cost	Reduction/disruption in production capacity	>6 years	Direct	Virtually certain	High	If complete shutdown occurs, the revenues associated with these units will be lost. Centralia accounted for \$431 million in revenue and \$67M in EBITDA in 2015. We actively look at opportunities for coal to gas transition, CCS, and other offset opportunities to reduce the impact.	We continue to explore the development of natural gas fired generation in the region to supplement the lost production, and potential coal to gas and CCS possibilities. However, it remains virtually certain that we will no longer have coal generation here.	Existing employees already manage these risks on an ongoing basis, and as such there is no increase in management costs.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	and feasibility.								
Uncertainty surrounding new regulation	In the US, the Environmental Protection Agency (EPA) is using its authority under the Clean Air Act to issue standards that address greenhouse gas emissions from new and existing power plants. The EPA issued proposed standards for new units in September 2013 which would preclude the construction of new coal fired facilities without CCS. In June 2014 the US EPA released the Clean Power Plan (CPP) proposal which provides state specific	Increased operational cost	1 to 3 years	Direct	More likely than not	Medium	Due to the previously negotiated Washington State Senate Bill 5769 we expect the US EPA regulation to have minimal impact on our Centralia facility, however if complete shutdown occurs, the revenues associated with these units will be lost. Centralia accounted for \$62M in EBITDA in 2014. We actively look at opportunities for coal to gas transition, CCS, and other offset opportunities to reduce the	We engage with government on an ongoing basis to provide input and lobby for consistency between state and federal regulations. We continue to explore the development of natural gas fired generation in the region to supplement the lost production, and potential coal to gas and CCS possibilities. However, it remains virtually certain that we will no longer have coal generation here.	Existing employees already manage these risks on an ongoing basis, and as such there is no increase in management costs.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	guidelines for emission intensities to be achieved by existing power plants. The proposed rules are expected to be finalized in summer 2015. Once finalized, the proposal requires states to prepare state implementation plans by summer 2016. The CPP already considers the shutdown of Centralia and there is no material incremental impact on our existing coal units at Centralia.						impact.		
Emission reporting obligations	TransAlta's Alberta operations already adhere to the Alberta government's	Increased operational cost	Up to 1 year	Direct	Virtually certain	High	We currently incur \$30M-\$45M annually in compliance costs related to the SGER	We currently manage the existing obligations through our power purchase	Additional time will be required to procure offsets and manage increased

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>GHG emissions regulations implemented in 2007. The regulations are comprised of a market-based baseline/credit regulatory framework. Facility specific emissions intensity targets must be met by companies: those with intensities below the target receive credits which they can sell, and those who emit above the mandated target make payments (\$20/tonne) to the Alberta government, who allocate funds to organizations developing and researching low-emissions technologies.</p>						<p>regulation. Compliance costs are set to double to \$30 a tonne in 2017, which will result in a doubling of our compliance costs to \$60M-100M annually, which will impact our bottom line and our customer base.</p>	<p>arrangements (PPA) and flow-through of costs. With PPA roll off, we anticipate that the obligations will be managed through ongoing emission reductions, purchase of carbon credits and payment into the CCEMC. We diligently calculate and report these emissions on a monthly basis, and annually when we submit to Alberta Environment the data is all subject to third party assurance.</p>	<p>obligations. Estimate approximately an additional 100K, approx. 1 FTE-1.5 FTE in addition to current responsibilities.</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	AB's current SGER trading scheme was renewed in June 2015. In Nov, 2015 Alberta announced its Climate Leadership Plan. One component of that plan was to phase out all coal-fired GHG emissions by 2030. This would impact the expected operating lives of our wholly or jointly owned assets at Genesee 3, Keephills 3, and Sheerness.								

CC5.1b

Please describe your inherent risks that are driven by changes in physical climate parameters

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in precipitation extremes and droughts	Recent history hints at increased extreme weather events. We recently felt the full force of extreme weather in Alberta (2013) as floods caused extensive damage to our hydro operations and to our headquarters city, Calgary, AB.	Reduction/disruption in production capacity	Unknown	Direct	Unlikely	Medium-high	Our hydro operations accounted for 73 million in EBITDA in 2015. Disruptions in operations have already occurred in 2015/2016 as we have entered into interim agreements with the provincial government to use our dams for flood controls (no financial impact incurred by TransAlta). In addition to disrupted operations, the flood in 2013 cost TransAlta ~\$70 million (damage and lost revenue). In 2014 flood rebuild costs were \$22 million. TOTAL financial	Insurance deductibles covered \$5 million in losses. We now are working with the Government of Alberta to enter in to an agreement to manage water in the Bow River (river flows from the Rocky Mountains and runs through Calgary, AB and other large communities) to aid potential flood mitigation. We strive to keep our communities safe.	Changing the way we operate Hydro facilities we will impact our ability to generate power and associated revenues. We expect the cost to be in and around of 5-10% of revenue from Alberta Hydro, which is approximately ~\$16-33 million.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							implications to date: ~\$92 million		
Change in temperature extremes	For our Australia operations, there is a risk of increased summer temperatures where gas turbines could de-rate above normal. A more drastic range of extreme temperatures could be directly correlated to an increased incidence of extreme weather events such as cyclones.	Reduction/disruption in production capacity	3 to 6 years	Direct	Likely	Low-medium	The increased temperatures in Australia could result in lost production and associated revenue, should production be disturbed. Australia provided \$163M in revenue in 2014. An average 10% de rate would reduce revenue by ~\$16M.	For planning purpose (such as with our new South Hedland project) we can ensure design of facilities incorporates changes in ambient temperatures. This may include turbine positing, insulation and cooling procedures. For existing sites, this will require adjustments to cooling mechanisms and possible changes in generation.	Additional capital costs: approximately \$250,000
Snow and ice	More frequent extreme winter temperatures could increase the frequency of icing events (blade icing) at our wind farms, which could result in	Reduction/disruption in production capacity	1 to 3 years	Direct	Likely	Low-medium	Snow and ice has the ability to reduce wind fleet capacity at our eastern operations, which provided \$197 million of revenue in 2015. A 2-4%	Installation of de-icing equipment on our wind sites has been piloted where it has presented as a major issue. Continuing this pilot program and monitoring	Pilot project capital costs and management, reporting and analyses of results, 0.25 FTE.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	unanticipated downtime.						reduction in generation would result in potential revenue losses of \$4-\$8 million.	weather patterns is our best option at this time.	
Tropical cyclones (hurricanes and typhoons)	There is expected to be an increase in cyclone activity, affecting our newly acquired Solomon Power station in Australia. Although cyclone strength dissipates inland, large amounts of rain and high winds still remain a physical risk. Our other Australia site, South Hedland, is coastal and could be directly affected by storm surge, wind and rain.	Reduction/disruption in production capacity	1 to 3 years	Direct	About as likely as not	Low	For Solomon, the fact that the facility is located inland will minimize the impact of cyclones on operations. South Hedland (currently under construction) is aware that their location could be impacted, and damage prevention is built into the capital cost. Disruption of services and direct revenue impact are possible. It is difficult to predict exact impacts, but approx. 1 million is possible.	Facility design specifications, careful weather pattern monitoring, and comprehensive environmental management systems.	We already incorporate much of this management into day to day operations, so no significant additional costs are anticipated.
Other	Climate	Reduction/disruption	>6 years	Direct	About as	Low	Could severely	Management	We already

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
physical climate drivers	change modeling suggests that the frequency of extreme tornado activity in North America will expand into northern latitudes, with the potential to specifically impact facilities in central Alberta, Southern Ontario and Quebec.	in production capacity			likely as not		damage wind turbines, turbine blades, and power transport infrastructure. Damages in the millions would be possible, with repairs, insurance claims, and lost revenue accounted for.	would include careful monitoring of severe weather, and comprehensive environmental management systems.	incorporate much of this management into day to day operations, so no significant additional costs are anticipated.
Change in precipitation extremes and droughts	Potential for droughts in Alberta pose a risk to our hydro facilities in terms of downstream obligations. We are responsible for water flow to people and industry downstream.	Reduction/disruption in production capacity	>6 years	Direct	About as likely as not	Low	We currently have an interim agreement with the Alberta government to manage water flows for flood prevention. However, if drought conditions become apparent, then a new strategy would need to be crafted. Using our hydro	Monitoring of river and stream flows currently occurs on a 24/7 basis. We carefully watch snowpack levels, stream flows, and rainfall when planning reservoir capacities. While drought and flood conditions impact these decisions, the infrastructure	We already incorporate much of this management into day to day operations, so no significant additional costs are anticipated.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							facilities for water management as opposed to electricity generation impacts our revenues associated with these units.	and planning capabilities are already in place.	

CC5.1c

Please describe your inherent risks that are driven by changes in other climate-related developments

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Reputation	Our existing coal fleet makes up 56% of our capacity and is scheduled to be retired by 2061 (majority by 2029). Some stakeholders have a	Increased capital cost	3 to 6 years	Indirect (Client)	About as likely as not	High	Uncertainty around coal regulations, future coal capital costs (to clean our fleet) and revenue losses from intended shutdown (our planned	TransAlta is committed to growth in renewables and gas generation and we have an active and comprehensive climate change strategy, which has been in motion since 2000. We have reduced in coal net capacity from 73% to 56%, decommissioned a 570 MW coal generating station, developed 1,379 MW of wind generating capacity and added	From 2000-2015 there have been costs associated with development and acquisition of wind and gas assets. In the next 1-2 years planned costs (announced) include \$570

Risk driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	negative outlook on the future of coal, because of environmental impacts, regulation uncertainty and costs to convert coal to a cleaner power generation source.						action) has led to reduced valuation of TransAlta's stock price over the last several years. TA shares (TSX:TA.TO) dropped from \$9.06 to \$3.54 in 2015. For an investor with 1000 shares, for example, this results in a loss of ~\$5,500 dollars. Future reduction in our stock price has further financial implications to our investors.	698 MW of natural gas generation capacity. In 2014, we announced our transition away from coal, confirming our business strategy to move from coal to low carbon generation sources. See more at: <a href="http://www.transalta.com/about-us/coal-transition">http://www.transalta.com/about-us/coal-transition</a>	AUD, which will go to contracting, designing and permitting the construction of highly efficient gas fired generation station in South Hedland, Australia. Promoting and building messaging around this transition to a lower carbon business model also carries cost. We estimate \$100,000 in costs (which includes a percentage of numerous employees in our Communications team, BD and regulatory).
Changing consumer behaviour	Some uncertainty exists with	Reduced demand for goods/service	3 to 6 years	Direct	About as likely as not	Low	TransAlta has a mix of large scale	Continuing on with the TransAlta growth strategy directed at natural gas and	We already incorporate much of this

Risk driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>consumer trends for energy. Some consumers currently prefer purchasing electricity from "green sources" and it is possible that these consumer choices could lead to a shift in the grid towards more localized power stations and/or self-sufficiency. This may require the accelerated development of new technologies on the part of industry.</p>	s					<p>and small scale decentralized facilities. The impact would be to our large scale facilities. TransAlta has the majority of its renewable energy facilities already Eco-Logo certified. The impact could be a reduction in shareholder value, reduction in stock price, exclusion from green investment indices, and customers looking elsewhere for their electricity needs. While</p>	<p>renewables generation. TransAlta also has an active and comprehensive climate change strategy that will help to mitigate this risk, as well as renewable energy sources, a current coal phase our plan, and a strong customer group. We will manage this risk as it becomes more apparent, but currently we leverage our existing management methods.</p>	<p>management into day to day operations, so no significant additional costs are anticipated.</p>

Risk driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							there may be a movement of this type, the cost implications for customers would be large. We also are able to offer a green portfolio and RECs, which should help mitigate this issue.		
Fluctuating socio-economic conditions	The global economy continues to be in flux. Some recent renewables growth has been driven through government policies that have resulted in the signing of long term procurement contracts by government. Continued	Reduced demand for goods/services	1 to 3 years	Direct	More likely than not	Low-medium	TransAlta growth is not reliant on the procurement of government contracts. The majority of our customers are corporations.	Continue to contract with a variety of different counterparties.	We already incorporate much of this management into day to day operations, so no significant additional costs are anticipated.

Risk driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	difficulties with the economy could result in fewer of these contracts being made available.								

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CC5.1d

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in regulation that have the potential to generate a substantive change in your business operations, revenue or expenditure

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CC5.1e

Please explain why you do not consider your company to be exposed to inherent risks driven by physical climate parameters that have the potential to generate a substantive change in your business operations, revenue or expenditure

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CC5.1f

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in other climate-related developments that have the potential to generate a substantive change in your business operations, revenue or expenditure

**Further Information**

**Page: CC6. Climate Change Opportunities**

**CC6.1**

**Have you identified any inherent climate change opportunities that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply**

- Opportunities driven by changes in regulation
- Opportunities driven by changes in physical climate parameters
- Opportunities driven by changes in other climate-related developments

**CC6.1a**

**Please describe your inherent opportunities that are driven by changes in regulation**

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Renewable energy regulation	TransAlta has competitive advantage in the construction and operation of renewable energy facilities.	Investment opportunities	1 to 3 years	Direct	More likely than not	Medium-high	Acquisition and development costs. Wind costs approximately \$2 million/MW of capacity to build	Having a diversified growth strategy is a core company value. Our	Development of a new 100 MW wind farm could cost approximately \$200 million, but payback in

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>Growth of renewable energy generation is a key aspect of TransAlta's business strategy. Combined load growth and coal retirement will drive demand for new generation (AESO estimates 6,000 MW of new, clean generation will be required by 2022).</p>						<p>(a 100 MW net capacity facility is ~\$200 million) With a renewable regulation it is possible we would see incentives and opportunities to contract long-term (we have experienced this in some provinces and taken advantage of these opportunities). Some of our wind assets in eastern Canada earn anywhere from \$0.25-0.33 million/ MW net capacity under long-term contracts (development driven by renewable regulations). Hence a new 100 MW net capacity wind farm, contracted under a 20-25 net capacity,</p>	<p>creation of TransAlta Renewables Inc. allowed for additional capital access, and we have leveraged this for growth projects. Management remains status quo, we have a team scoping new technologies and opportunities and an established BD team.</p>	<p>6.5 years under the right contracting conditions.</p>

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							could earn approximately \$30 million annually (payback in 6.5 years and earn revenue for 20+ years after payback). We have not factored the potential value of carbon offsets/certificate created from wind, which could increase in value in the future.		
Cap and trade schemes	TransAlta's Alberta wind facilities currently create ~500,000 tonnes / year of saleable greenhouse gas credits. These credits generate an incremental revenue stream. Our Le Nordais wind facility in Quebec provides	New products/business services	Up to 1 year	Direct	Virtually certain	Medium	Approx. \$10M / year from sales of emission offsets and Renewable Energy Credits is generated annually. Increasing carbon market prices would generally have a positive impact on this division, and could easily double to \$20M. In June/2015 it	Emission credits and RECs are managed by our trading group, which would continue to be the case. Additional marketing of our green energy portfolio and REC's to new and existing customers	No incremental costs anticipated, as we already have the management in place. If significant marketing/sales demand becomes apparent, possibly 1-2 additional FTE (100K estimate)

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Renewable Energy Credit (REC) trading opportunities.						was announced carbon prices will increase in Alberta to \$30 in 2017 (up from \$15). Our offset credits, created annually from qualifying wind facilities in Alberta, will double their revenue in 2017 (up ~\$6M).	can also generate additional revenue.	
Emission reporting obligations	TransAlta is able to promote to stakeholders its commitment to sustainable energy development through emissions reporting such as the CDP and the Report on Sustainability. We are moving towards integrated reporting, which will pair our financials directly with our emissions data.	Increased stock price (market valuation)	Up to 1 year	Direct	More likely than not	Low-medium	Transparency, emission target setting, and emission reduction can increase shareholder value. Specialty investment communities are focused on sustainable corporations, which TransAlta and TransAlta Renewables can give access to. Since initial offering, the share price for TransAlta Renewables has	Continue reporting to CDP, and the TransAlta Report on Sustainability. Move into integrated reporting, to increase visibility of emissions performance and sustainability data.	No incremental costs anticipated, as we already have the management in place.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							increased by over 20%, and dividends to shareholders has also increased significantly.		
Renewable energy regulation	TransAlta Renewable Energy Credits (RECs) and GHG offsets are marketed to third parties to help with their green energy commitments. TransAlta also sells flyash and bottom ash to cement manufacturers.	Premium price opportunities	1 to 3 years	Direct	More likely than not	Medium-high	TransAlta already sells RECs and GHG offsets from existing renewable facilities. Facility growth in this area will lead to greater future revenues from these by-products. TransAlta is also committed to increasing sales of flyash and we look for new customers on an ongoing basis. Financially, our fly ash partnership allows us to not only offset the cost of disposal, but also to create a financial gain	Emission credits and RECs are managed by our trading group, who work strategically to hedge carbon credits and allow us to not only meet our carbon obligations in current years, but future ones as well. The flyash sales are managed by our by-products group, who carefully track production data for planning and sale purposes	No incremental costs anticipated, as we already have the management in place.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							(dollar values are confidential, but we did sell 850,000 tonnes of fly ash in 2014).	on an ongoing basis.	
International agreements	We see international agreements on climate change as a business opportunity. TransAlta has confidence in our strategically placed assets. Recent developments such as the acquisition of 215MW of renewable assets in the US, a natural gas plant and a pipeline expansion in Western Australia, and renewables growth across Canada, all contribute to a diversification of asset base. We feel that the	Investment opportunities	1 to 3 years	Direct	More likely than not	Medium-high	The TransAlta growth strategy is focused on building shareholder value through growth in natural gas and renewables generation. This creates competitive advantage. Financial benefits are difficult to estimate depending on new growth, but expected to be positive.	Having a diversified growth strategy is a core company value. Our creation of TransAlta Renewables Inc. allowed for additional capital access, and we have leveraged this for growth projects. Focusing on our 3 geographical areas of expertise allows us to provide input on policy and potential agreements.	There are no management costs associated with this opportunity driver (other than growth capital costs) as we already have the management in place.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	inherent risks associated with international agreements, or the uncertainties of them, are mitigated/limited to some degree through focusing only on Canadian, American and Australian markets. These are regions of some of the highest load growth potential and of historically stable geopolitical climates.								
Emission reporting obligations	Reporting regulations provide TransAlta visibility into emissions coming from the supply chain. We see the increased necessity of reporting	Wider social benefits	3 to 6 years	Indirect (Supply chain)	More likely than not	Low	We do not anticipate financial impact or gain from increased regulation in this area.	Internal engagement with supply chain management group, engagement with peer groups, benchmarking our current performance.	No incremental costs anticipated, as we already have the management in place.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	emissions as a valuable tool to evaluate our suppliers energy inputs and can help us make supply chain choices.								
Other regulatory drivers	Climate change, emissions standards, carbon cap and trade and other emission reduction activities are likely to emerge in the coming years. We see this as an opportunity, as we have experience in many jurisdictions of renewables, co-generation, and CCS. Through Project Pioneer TransAlta has gained significant expertise regarding CCS technology.	Investment opportunities	3 to 6 years	Direct	About as likely as not	Low-medium	An anticipated increase in revenues from renewables facilities is predicted, as a move from coal (traditionally the least expensive energy source) to other forms of generation, along with anticipated load growth, will increase the price of power. As we are an experienced generator and operator, we can use our experience as an advantage to both build and acquire new projects. Financial	Having a diversified growth strategy is a core company value. Our creation of TransAlta Renewables Inc. allowed for additional capital access, and we have leveraged this for growth projects. We have an established new technologies group that tracks progress of developing and ground breaking	No incremental costs anticipated, as we already have the management in place.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							benefits are difficult to estimate depending on new growth.	technologies, including but not limited to renewables, energy storage, coal gas transition, and biomass.	
Product efficiency regulations and standards	TransAlta is exploring piloting energy storage at our wind facilities. Our current barrier has been market rule restrictions around storing energy. Having energy storage available will allow TransAlta to store energy during offpeak times, and use the stored energy during the peak electrical day, allowing for better grid efficiency and additional use of renewable energy.	New products/business services	1 to 3 years	Direct	Likely	Medium	Providing customers with energy storage will be a new business venture for TransAlta, so this is anticipated to be a revenue addition. However, due to the shift in energy use (customers are able to use off-peak energy) we anticipate lower costs to our customers and a lower overall energy price.	We will work with customers to meet their energy and cost requirements, and work to develop new product offerings.	TransAlta was awarded \$250,000 from Alberta Innovates - Energy & Environment Solutions (AI-EES) to help launch this project (Alberta's first large-scale commercial energy storage project). We will incur the additional development and deployment costs on our own.

CC6.1b

Please describe the inherent opportunities that are driven by changes in physical climate parameters

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in mean (average) temperature	If temperatures increase, we expect spring, summer, fall electricity loads to also increase (due to increase demand for cooling).	Premium price opportunities	1 to 3 years	Direct	More likely than not	Low-medium	An increase in demand typically leads to higher price per MWh, which would have direct positive impact on our revenue. Currently we earn \$124 million of revenue from MWh merchant sales. Price spikes could see this total increase anywhere from 10-20% (or much more). A 15% increase would add ~\$18.5 million of revenue annually.	We currently have a geographically diverse portfolio, diverse fuel types and an active energy trading group, so we are well positioned to take advantage and quickly deploy generation when demand spikes, allowing us to realize revenue.	No incremental costs anticipated, as assets are already in operation.
Change in temperature extremes	Climate change may result in hotter summer temperatures, especially in Northern latitudes. For Alberta, hotter	Increased demand for existing products/services	3 to 6 years	Direct	More likely than not	Low-medium	Greater electricity revenues in Alberta and the Pacific Northwest, increased load demand	We currently have a geographically diverse portfolio, diverse fuel types and an active energy trading group, so	No incremental costs anticipated.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	summers will have a direct impact on demand, as people increase their electricity usage for cooling. Greater market volatility (regarding electricity price and demand) will result in greater trading opportunities.						generally increases electricity prices, which would directly impact our revenues. We foresee a positive financial impact, although exact projections would be difficult to estimate.	we are well positioned to take advantage and quickly deploy generation when demand spikes, allowing us to realize revenue.	
Other physical climate opportunities	Increased wind activity or a change in wind pattern could correlate to an increase in marketable RECs (renewable energy credits).	Increased production capacity	>6 years	Direct	About as likely as not	Low-medium	A change in wind patterns (possible as a result of changing jet-streams) could increase wind in some areas. An increase in wind availability would directly increase our revenues from this business group. We foresee a positive financial impact, although exact projections would be difficult to estimate.	We have wind expertise in building, acquiring, and managing wind sites, so should new areas become attractive to wind investment we would be ready to take advantage.	Cost of capital for building and acquiring wind.

Please describe the inherent opportunities that are driven by changes in other climate-related developments

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Reputation	Shift away from coal and towards low carbon power generation will help build TransAlta's reputation as an environmentally conscious company.	Increased stock price (market valuation)	>6 years	Direct	About as likely as not	Medium-high	Increased valuation and stock price stability will help TransAlta raise ~\$1 billion in equity financing (2021-2025), in order to support development and acquisition of profitable low carbon power generation assets. Increased valuation and stock price stability will benefit TransAlta shareholders. TA.TO shares closed at \$10.48 in 2014. When coal risk is not priced in to our stock valuation, we could expect an increase to \$15+ (analyst expectations are currently \$14 in 1YR). Hence, an	.Formed TransAlta Renewables (TRI.TO) as an investment vehicle to allow investors the ability to invest in low carbon and long-term contracted assets (steady yield). Management commitment to transition away from coal (will be priced out of TransAlta's Corporations stock, TA.TO).	Cost to form TransAlta Renewables in 2013. Equity financing increases debt levels. In the interim (between now and 2021), TransAlta is committed to lowering debt levels and keeping these at a steady rate. Electricity prices in our markets are forecast to grow. Shutting down coal operations. Approximately \$163 million in annual revenue or \$61 million in EBITDA reduction will begin from 2019+.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							investor with 1000 shares at Dec 2014 we see an increase of \$4,500 dollars in their stocks value, plus TransAlta pays a quarterly dividend of \$0.18. In 6 years this investor would also make \$4,320 in dividends.		
Changing consumer behaviour	Consumer choices may increase demand for "green" energy. TransAlta's large portfolio of renewable energy could realize increased demand and revenue.	Increased demand for existing products/services	1 to 3 years	Direct	About as likely as not	Medium	Higher demand and premiums for renewable energy could lead to EBITDA increases of 21 million in EBITDA (assumes a 10% increase in revenue/MWh). In Alberta, for example, customers will contract electricity through third-party retailers, such as Bullfrog Power, to know they are supporting 100% renewable	Diversified growth strategy focused on natural gas and renewables, creation of TransAlta Renewables Inc. as an investment in renewables, targets that minimize our emissions and reduce our dependence on coal generation, also continue to promote renewable	No specific cost related to increased demand for consumer green energy. Leveraging existing assets. Internal costs associated with formation of TRI (occurred in 2013) and with communication of renewable energy

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							energy. If demand for these services increase, supply will also be constrained until new renewable energy is introduced, which could result in higher premiums. (We have assumed a 10% increase)	energy amongst our stakeholders and reputation pieces.	

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CC6.1d

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in regulation that have the potential to generate a substantive change in your business operations, revenue or expenditure

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CC6.1e

Please explain why you do not consider your company to be exposed to inherent opportunities driven by physical climate parameters that have the potential to generate a substantive change in your business operations, revenue or expenditure

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**CC6.1f**

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in other climate-related developments that have the potential to generate a substantive change in your business operations, revenue or expenditure

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**Further Information**

**Module: GHG Emissions Accounting, Energy and Fuel Use, and Trading**

**Page: CC7. Emissions Methodology**

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**CC7.1**

Please provide your base year and base year emissions (Scopes 1 and 2)

Scope	Base year	Base year emissions (metric tonnes CO2e)
Scope 1	Sat 01 Jan 2005 - Sat 31 Dec 2005	41675690
Scope 2 (location-based)	Sat 01 Jan 2005 - Sat 31 Dec 2005	192365
Scope 2 (market-based)		

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**CC7.2**

**Please give the name of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions**

<b>Please select the published methodologies that you use</b>
Australia - National Greenhouse and Energy Reporting Act
The Climate Registry: Electric Power Sector (EPS) Protocol
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)
US EPA Climate Leaders: Direct Emissions from Stationary Combustion
Other

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**CC7.2a**

**If you have selected "Other" in CC7.2 please provide details of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions**

Government of Alberta, Technical Guidance for Completing Specified Gas Compliance Reports  
Government of Alberta, Specified Gas Reporting Standard  
Government of Canada, Technical Guidance on Reporting Greenhouse Gas Emissions  
Ontario Ministry of the Environment, Guideline for Greenhouse Gas Emissions Reporting  
USEPA, 40 CFR Part 98, Mandatory Reporting of Greenhouse Gases; Final Rule

Ontario verification (it is reasonable level of assurance):

We conducted our audit in accordance with Canadian Generally Accepted Auditing standards, the Regulation (O. Reg. 452/09), and ISO 14064 Part 3. Those standards and regulations require that we plan and perform an audit to obtain reasonable assurance whether the emissions inventory assertion in CO2e is free of material errors, omissions or misrepresentations based on the criteria in the Regulation, and whether it conforms to the requirements of the Regulation. An audit includes examining, on a test basis, evidence supporting the assertions and disclosures regarding the emissions inventory assertion. An audit also includes assessing the methodology used and assumptions made by management, as well as evaluating the overall emissions inventory assertion presentation based on the requirements of the Regulation.

Alberta (Reasonable) Verification:

Alberta coal facility baselines have been third party assured to a level of reasonable assurance in accordance with local regulation, the Specified Gas Emitters Regulation.

Aligns with the following: ISO 14064 Part 3

Canadian Standard for Assurance Engagements (CSAE) 3410, Assurance Engagements on Greenhouse Gas Standards

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**CC7.3**

**Please give the source for the global warming potentials you have used**

<b>Gas</b>	<b>Reference</b>
CO2	IPCC Second Assessment Report (SAR - 100 year)
CH4	IPCC Second Assessment Report (SAR - 100 year)
N2O	IPCC Second Assessment Report (SAR - 100 year)
HFCs	IPCC Second Assessment Report (SAR - 100 year)
SF6	IPCC Second Assessment Report (SAR - 100 year)

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**CC7.4**

**Please give the emissions factors you have applied and their origin; alternatively, please attach an Excel spreadsheet with this data at the bottom of this page**

<b>Fuel/Material/Energy</b>	<b>Emission Factor</b>	<b>Unit</b>	<b>Reference</b>
			See Attachment

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**Further Information****Attachments**

**Page: CC8. Emissions Data - (1 Jan 2013 - 31 Dec 2013)**

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**CC8.1**

**Please select the boundary you are using for your Scope 1 and 2 greenhouse gas inventory**

Operational control

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**CC8.2**

**Please provide your gross global Scope 1 emissions figures in metric tonnes CO<sub>2</sub>e**

30522140

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**CC8.3**

**Does your company have any operations in markets providing product or supplier specific data in the form of contractual instruments?**

No

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**CC8.3a**

**Please provide your gross global Scope 2 emissions figures in metric tonnes CO<sub>2</sub>e**

Scope 2, location-based	Scope 2, market-based (if applicable)	Comment
187280		Historical TransAlta 2013 scope 2 emissions were adjusted in 2016 to account for an emission factor error. Scope 2 emission totals were adjusted 0.1%

**CC8.4**

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

No

**CC8.4a**

Please provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure

Source	Relevance of Scope 1 emissions from this source	Relevance of location-based Scope 2 emissions from this source	Relevance of market-based Scope 2 emissions from this source (if applicable)	Explain why the source is excluded

**CC8.5**

**Please estimate the level of uncertainty of the total gross global Scope 1 and 2 emissions figures that you have supplied and specify the sources of uncertainty in your data gathering, handling and calculations**

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
Scope 1	More than 2% but less than or equal to 5%	Assumptions Extrapolation Data Management	Measurement standards meet industry and regulation best practice. Internal data is internally scrutinized and verified by a third part. Calibration inaccuracies are possible with the CEMS systems, although regular maintenance and calibration is conducted to avoid such inaccuracies. At our coal facilities in Alberta, TransAlta utilizes lab analyses from three different laboratories to ensure accuracy of coal quality results and avoid inherent bias.
Scope 2 (location-based)	More than 2% but less than or equal to 5%	Metering/ Measurement Constraints Data Management	Inaccuracies in meter reads and management of collected data are the most problematic issues surrounding scope 2 emissions. TransAlta checks all data for errors.
Scope 2 (market-based)			

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#### CC8.6

**Please indicate the verification/assurance status that applies to your reported Scope 1 emissions**

Third party verification or assurance process in place

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#### CC8.6a

**Please provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements**

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/section reference	Relevant standard	Proportion of reported Scope 1 emissions verified (%)
Annual process	Complete	Limited assurance	<a href="https://www.cdp.net/sites/2016/28/19328/Climate%20Change%202016/Shared%20Documents/Attachments/CC8.6a/2013-Report-on-Sustainability.pdf">https://www.cdp.net/sites/2016/28/19328/Climate Change 2016/Shared Documents/Attachments/CC8.6a/2013-Report-on-Sustainability.pdf</a>	53	ISAE3000	100

#### CC8.6b

Please provide further details of the regulatory regime to which you are complying that specifies the use of Continuous Emissions Monitoring Systems (CEMS)

Regulation	% of emissions covered by the system	Compliance period	Evidence of submission

#### CC8.7

Please indicate the verification/assurance status that applies to at least one of your reported Scope 2 emissions figures

Third party verification or assurance process in place

#### CC8.7a

Please provide further details of the verification/assurance undertaken for your location-based and/or market-based Scope 2 emissions, and attach the relevant statements

Location-based or market-based figure?	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 2 emissions verified (%)
Location-based	Annual process	Complete	Limited assurance	<a href="https://www.cdp.net/sites/2016/28/19328/Climate%20Change%202016/Shared%20Documents/Attachments/CC8.7a/2013-Report-on-Sustainability.pdf">https://www.cdp.net/sites/2016/28/19328/Climate Change 2016/Shared Documents/Attachments/CC8.7a/2013-Report-on-Sustainability.pdf</a>	53	ISAE3000	100

#### CC8.8

Please identify if any data points have been verified as part of the third party verification work undertaken, other than the verification of emissions figures reported in CC8.6, CC8.7 and CC14.2

Additional data points verified	Comment
Year on year change in emissions (Scope 1 and 2)	Yes, our third-party assurance provider conducts emissions intensity trending, generally through 3 years. Hence for 2013 the trending analysis was 2011 to 2013.
Year on year emissions intensity figure	Yes, our third-party assurance provider conducts emissions intensity trending, generally through 3 years. Hence for 2013 the trending analysis was 2011 to 2013.

#### CC8.9

Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

#### CC8.9a

Please provide the emissions from biologically sequestered carbon relevant to your organization in metric tonnes CO2

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#### Further Information

Please note 100% of our operational control GHG data is subject to third party limited assurance. Please note sustainability data in the TransAlta 2013 Sustainability Report has been rounded, hence slight variations. Limited assurance of scope 1 and scope 2 emissions follows operational control as per the GHG Protocol's: A Corporate Accounting and Reporting Standard. In addition, Alberta coal facility GHG data, which comprises approximately 60-70% of our GHG data, is subject to reasonable assurance by a third party as per the Alberta Specified Gas Emitters Regulation. Our Ontario gas facilities are also subject to additional limited assurance as per Ontario 452/09 regulations, which comprises a further 7% of GHG emissions. These documents can be made available upon request.

**Page: CC8. Emissions Data - (1 Jan 2014 - 31 Dec 2014)**

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#### CC8.1

**Please select the boundary you are using for your Scope 1 and 2 greenhouse gas inventory**

Operational control

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#### CC8.2

**Please provide your gross global Scope 1 emissions figures in metric tonnes CO2e**

34892415

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#### CC8.3

**Does your company have any operations in markets providing product or supplier specific data in the form of contractual instruments?**

No

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**CC8.3a**

**Please provide your gross global Scope 2 emissions figures in metric tonnes CO<sub>2</sub>e**

Scope 2, location-based	Scope 2, market-based (if applicable)	Comment
182349		Historical TransAlta 2014 scope 2 emissions were adjusted in 2016 to account for an emission factor error. Scope 2 emission totals were adjusted 0.04%

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**CC8.4**

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

No

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**CC8.4a**

**Please provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure**

Source	Relevance of Scope 1 emissions from this source	Relevance of location-based Scope 2 emissions from this source	Relevance of market-based Scope 2 emissions from this source (if applicable)	Explain why the source is excluded
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**CC8.5**

Please estimate the level of uncertainty of the total gross global Scope 1 and 2 emissions figures that you have supplied and specify the sources of uncertainty in your data gathering, handling and calculations

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
Scope 1	More than 2% but less than or equal to 5%	Assumptions Extrapolation Data Management	Measurement standards meet industry and regulation best practice. Internal data is internally scrutinized and verified by a third part. Calibration inaccuracies are possible with the CEMS systems, although regular maintenance and calibration is conducted to avoid such inaccuracies. At our coal facilities in Alberta, TransAlta utilizes lab analyses from three different laboratories to ensure accuracy of coal quality results and avoid inherent bias.
Scope 2 (location-based)	More than 2% but less than or equal to 5%	Metering/ Measurement Constraints Data Management	Inaccuracies in meter reads and management of collected data are the most problematic issues surrounding scope 2 emissions. TransAlta checks all data for errors.
Scope 2 (market-based)			

**CC8.6**

Please indicate the verification/assurance status that applies to your reported Scope 1 emissions

Third party verification or assurance process in place

**CC8.6a**

Please provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/section reference	Relevant standard	Proportion of reported Scope 1 emissions verified (%)
Annual process	Complete	Limited assurance	<a href="https://www.cdp.net/sites/2016/28/19328/Climate Change 2016/Shared Documents/Attachments/CC8.6a/2014_Report_on_Sustainability.pdf">https://www.cdp.net/sites/2016/28/19328/Climate Change 2016/Shared Documents/Attachments/CC8.6a/2014_Report_on_Sustainability.pdf</a>	62-63	ISAE3000	100

**CC8.6b**

Please provide further details of the regulatory regime to which you are complying that specifies the use of Continuous Emissions Monitoring Systems (CEMS)

Regulation	% of emissions covered by the system	Compliance period	Evidence of submission

**CC8.7**

Please indicate the verification/assurance status that applies to at least one of your reported Scope 2 emissions figures

Third party verification or assurance process in place

**CC8.7a**

Please provide further details of the verification/assurance undertaken for your location-based and/or market-based Scope 2 emissions, and attach the relevant statements

Location-based or market-based figure?	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 2 emissions verified (%)
Location-based	Annual process	Complete	Limited assurance	<a href="https://www.cdp.net/sites/2016/28/19328/Climate%20Change%202016/Shared%20Documents/Attachments/CC8.7a/2014_Report_on_Sustainability.pdf">https://www.cdp.net/sites/2016/28/19328/Climate Change 2016/Shared Documents/Attachments/CC8.7a/2014_Report_on_Sustainability.pdf</a>	62-63	ISAE3000	100

**CC8.8**

Please identify if any data points have been verified as part of the third party verification work undertaken, other than the verification of emissions figures reported in CC8.6, CC8.7 and CC14.2

Additional data points verified	Comment
Year on year change in emissions (Scope 1 and 2)	Yes, our third-party assurance provider conducts emissions trending, generally through 3 years. Hence for 2014 the trending analysis was 2012 to 2014.

Additional data points verified	Comment
Year on year emissions intensity figure	Yes, our third-party assurance provider conducts emissions trending, generally through 3 years. Hence for 2014 the trending analysis was 2012 to 2014.

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#### CC8.9

**Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?**

No

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#### CC8.9a

Please provide the emissions from biologically sequestered carbon relevant to your organization in metric tonnes CO2

---

#### Further Information

Please note 100% of our operational control GHG data is subject to third party limited assurance. Please note sustainability data in the TransAlta 2014 Sustainability Report has been rounded, hence slight variations. Limited assurance of scope 1 and scope 2 emissions follows operational control as per the GHG Protocol's: A Corporate Accounting and Reporting Standard. In addition, Alberta coal facility GHG data, which comprises approximately 60-70% of our GHG data, is subject to reasonable assurance by a third party as per the Alberta Specified Gas Emitters Regulation. Our Ontario gas facilities are also subject to additional limited assurance as per Ontario 452/09 regulations, which comprises a further 7% of GHG emissions. These documents can be made available upon request.

**Page: CC8. Emissions Data - (1 Jan 2015 - 31 Dec 2015)**

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#### CC8.1

**Please select the boundary you are using for your Scope 1 and 2 greenhouse gas inventory**

Operational control

---

**CC8.2**

**Please provide your gross global Scope 1 emissions figures in metric tonnes CO2e**

32041425

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**CC8.3**

**Does your company have any operations in markets providing product or supplier specific data in the form of contractual instruments?**

No

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**CC8.3a**

**Please provide your gross global Scope 2 emissions figures in metric tonnes CO2e**

Scope 2, location-based	Scope 2, market-based (if applicable)	Comment
186390		

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**CC8.4**

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

No

CC8.4a

Please provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure

Source	Relevance of Scope 1 emissions from this source	Relevance of location-based Scope 2 emissions from this source	Relevance of market-based Scope 2 emissions from this source (if applicable)	Explain why the source is excluded

CC8.5

Please estimate the level of uncertainty of the total gross global Scope 1 and 2 emissions figures that you have supplied and specify the sources of uncertainty in your data gathering, handling and calculations

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
Scope 1	More than 2% but less than or equal to 5%	Assumptions Extrapolation Data Management	Measurement standards meet industry and regulation best practice. Internal data is internally scrutinized and verified by a third party. Calibration inaccuracies are possible with the CEMS systems, although regular maintenance and calibration is conducted to avoid such inaccuracies. At our coal facilities in Alberta, TransAlta utilizes lab analyses from three different laboratories to ensure accuracy of coal quality results and avoid inherent bias.
Scope 2 (location-based)	More than 2% but less than or equal to 5%	Metering/ Measurement Constraints	Inaccuracies in meter reads and management of collected data are the most problematic issues surrounding scope 2 emissions. TransAlta checks all data for errors.

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
		Data Management	
Scope 2 (market-based)			

**CC8.6**

Please indicate the verification/assurance status that applies to your reported Scope 1 emissions

Third party verification or assurance process in place

**CC8.6a**

Please provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/section reference	Relevant standard	Proportion of reported Scope 1 emissions verified (%)
Annual	Complete	Limited	<a href="https://www.cdp.net/sites/2016/28/19328/Climate Change 2016/Shared">https://www.cdp.net/sites/2016/28/19328/Climate Change 2016/Shared</a>	192-193	ISAE3000	100

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/section reference	Relevant standard	Proportion of reported Scope 1 emissions verified (%)
process		assurance	Documents/Attachments/CC8.6a/TransAlta_2015_Integrated_full_report.pdf			

#### CC8.6b

Please provide further details of the regulatory regime to which you are complying that specifies the use of Continuous Emissions Monitoring Systems (CEMS)

Regulation	% of emissions covered by the system	Compliance period	Evidence of submission

#### CC8.7

**Please indicate the verification/assurance status that applies to at least one of your reported Scope 2 emissions figures**

Third party verification or assurance process in place

#### CC8.7a

Please provide further details of the verification/assurance undertaken for your location-based and/or market-based Scope 2 emissions, and attach the relevant statements

Location-based or market-based figure?	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 2 emissions verified (%)
Location-based	Annual process	Complete	Limited assurance	<a href="https://www.cdp.net/sites/2016/28/19328/Climate%20Change%202016/Shared%20Documents/Attachments/CC8.7a/TransAlta_2015_Integrated_full_report.pdf">https://www.cdp.net/sites/2016/28/19328/Climate Change 2016/Shared Documents/Attachments/CC8.7a/TransAlta_2015_Integrated_full_report.pdf</a>	192-193	ISAE3000	100

#### CC8.8

Please identify if any data points have been verified as part of the third party verification work undertaken, other than the verification of emissions figures reported in CC8.6, CC8.7 and CC14.2

Additional data points verified	Comment
Year on year change in emissions (Scope 1 and 2)	Yes, our third-party assurance provider conducts emissions trending, generally through 3 years. Hence for 2015 the trending analysis was 2013 to 2015.
Year on year emissions intensity figure	Yes, our third-party assurance provider conducts emissions trending, generally through 3 years. Hence for 2015 the trending analysis was 2013 to 2015.

#### CC8.9

Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

#### CC8.9a

Please provide the emissions from biologically sequestered carbon relevant to your organization in metric tonnes CO2

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#### Further Information

Please note 100% of our operational control GHG data is subject to third party limited assurance. Please note sustainability data in the TransAlta 2015 Integrated Report has been rounded, hence slight variations. Limited assurance of scope 1 and scope 2 emissions follows operational control as per the GHG Protocol's: A Corporate Accounting and Reporting Standard. In addition, Alberta coal facility GHG data, which comprises approximately 60-70% of our GHG data, is subject to reasonable assurance by a third party as per the Alberta Specified Gas Emitters Regulation. Our Ontario gas facilities are also subject to additional limited assurance as per Ontario 452/09 regulations, which comprises a further 7% of GHG emissions. These documents can be made available upon request.

**Page: CC9. Scope 1 Emissions Breakdown - (1 Jan 2013 - 31 Dec 2013)**

---

#### CC9.1

**Do you have Scope 1 emissions sources in more than one country?**

Yes

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#### CC9.1a

**Please break down your total gross global Scope 1 emissions by country/region**

Country/Region	Scope 1 metric tonnes CO2e
Australia	740980
Canada	22227865
United States of America	7553295

---

**CC9.2**

**Please indicate which other Scope 1 emissions breakdowns you are able to provide (tick all that apply)**

- By business division
- By facility
- By GHG type
- By activity

---

**CC9.2a**

**Please break down your total gross global Scope 1 emissions by business division**

<b>Business division</b>	<b>Scope 1 emissions (metric tonnes CO2e)</b>
Coal	27501662
Natural Gas	3019940
Hydro	432
Wind & Solar	69
Corporate	44

---

**CC9.2b**

**Please break down your total gross global Scope 1 emissions by facility**

Facility	Scope 1 emissions (metric tonnes CO2e)	Latitude	Longitude
Sundance, AB, Canada	12182406		
Keephills, AB, Canada	4563786		
Keephills 3, AB Canada	3045756		
Highvale, AB, Canada	156418		
Fort Saskatchewan, AB, Canada	384621		
Mississauga, ON, Canada	365870		
Ottawa, ON, Canada	148133		
Windsor, ON, Canada	191040		
Sarnia, ON, Canada	1189296		
Centralia, WA, USA	7548963		
Centralia Mine, WA, USA	4332		
Leinster, WA, Australia	178228		
Mount Keith, WA, Australia	171691		
Kalgoorlie, WA, Australia	141694		
Kambalda, WA, Australia	150772		
Parkeston, WA, Australia	98594		
Hydro Facilities, Canada	432		
Wind Facilities, Canada	62		
Calgary Corporate Office	44		

**CC9.2c**

Please break down your total gross global Scope 1 emissions by GHG type

GHG type	Scope 1 emissions (metric tonnes CO2e)
CO2	30241065
CH4	90985

GHG type	Scope 1 emissions (metric tonnes CO2e)
N2O	190091
SF6	0

---

#### CC9.2d

Please break down your total gross global Scope 1 emissions by activity

Activity	Scope 1 emissions (metric tonnes CO2e)
Coal Fired Power Generation	27336732
Natural Gas Fired Power Generation	3019712
Coal Mining	61528
Coal Mining Operations	2934
Mining Vehicles	96288
Fleet Vehicles	4946

---

#### Further Information

**Page: CC9. Scope 1 Emissions Breakdown - (1 Jan 2014 - 31 Dec 2014)**

---

#### CC9.1

Do you have Scope 1 emissions sources in more than one country?

Yes

---

**CC9.1a**

Please break down your total gross global Scope 1 emissions by country/region

Country/Region	Scope 1 metric tonnes CO2e
Canada	26800131
United States of America	7453945
Australia	638339

---

**CC9.2**

Please indicate which other Scope 1 emissions breakdowns you are able to provide (tick all that apply)

- By business division
- By facility
- By GHG type
- By activity

---

**CC9.2a**

Please break down your total gross global Scope 1 emissions by business division

Business division	Scope 1 emissions (metric tonnes CO2e)
Coal	32180132
Natural Gas	2711707
Hydro	524
Wind	49
Corporate	4

**CC9.2b**

Please break down your total gross global Scope 1 emissions by facility

Facility	Scope 1 emissions (metric tonnes CO2e)	Latitude	Longitude
Sundance, AB, Canada	15096756		
Keephills, AB Canada	6300511		
Keephills 3, AB, Canada	3131600		
Highvale, AB, Canada	197320		
Fort Saskatchewan, AB, Canada	373598		
Mississauga, ON, Canada	344054		
Ottawa, ON, Canada	28110		
Windsor, ON, Canada	197927		
Sarnia, ON, Canada	1129678		
Centralia, WA, USA	7451265		
Centralia Mine, WA, USA	2680		
Leinster, WA, Australia	160634		
Mount Keith, WA, Australia	155588		
Kalgoorlie, WA, Australia	94220		
Kambalda, WA, Australia	104164		
Parkeston, WA, Australia	123733		

Facility	Scope 1 emissions (metric tonnes CO2e)	Latitude	Longitude
Hydro Facilities, Canada	524		
Wind Facilities, Canada	49		
Calgary Corporate Office	4		

---

**CC9.2c**

**Please break down your total gross global Scope 1 emissions by GHG type**

GHG type	Scope 1 emissions (metric tonnes CO2e)
CO2	34554566
CH4	117035
N2O	220815
SF6	0

---

**CC9.2d**

**Please break down your total gross global Scope 1 emissions by activity**

Activity	Scope 1 emissions (metric tonnes CO2e)
Coal Fired Power Generation	31974917
Natural Gas Fired Power Generation	2711520

Activity	Scope 1 emissions (metric tonnes CO2e)
Coal Mining	83546
Coal Mining Operations	3915
Mining Vehicles	112540
Fleet Vehicles	5978

---

#### Further Information

Historical TransAlta 2014 scope 1 emissions were adjusted in 2016 to account for an emission factor error. Scope 1 emission totals were adjusted -0.01%

**Page: CC9. Scope 1 Emissions Breakdown - (1 Jan 2015 - 31 Dec 2015)**

---

#### CC9.1

**Do you have Scope 1 emissions sources in more than one country?**

Yes

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#### CC9.1a

**Please break down your total gross global Scope 1 emissions by country/region**

Country/Region	Scope 1 metric tonnes CO2e
Canada	25322565
United States of America	5798857

Country/Region	Scope 1 metric tonnes CO2e
Australia	920003

---

**CC9.2**

**Please indicate which other Scope 1 emissions breakdowns you are able to provide (tick all that apply)**

- By business division
- By facility
- By GHG type
- By activity

---

**CC9.2a**

**Please break down your total gross global Scope 1 emissions by business division**

Business division	Scope 1 emissions (metric tonnes CO2e)
Coal	29081366
Natural Gas	2959255
Hydro	426
Wind	375
Corporate	3

---

**CC9.2b**

Please break down your total gross global Scope 1 emissions by facility

Facility	Scope 1 emissions (metric tonnes CO2e)	Latitude	Longitude
Sundance, AB, Canada	14431599		
Keephills, AB, Canada	5594353		
Keephills 3, AB, Canada	3055995		
Highvale, AB, Canada	200562		
Fort Saskatchewan, AB, Canada	326593		
Mississauga, ON, Canada	372145		
Ottawa, ON, Canada	39870		
Windsor, ON, Canada	192737		
Sarnia, ON, Canada	1107907		
Centralia, WA, USA	5796121		
Centralia Mine, WA, USA	2736		
Leinster, WA, Australia	159584		
Mount Keith, WA, Australia	176134		
Kalgoorlie, WA, Australia	120507		
Kambalda, WA, Australia	125609		
Parkeston, WA, Australia	131909		
Hydro Facilities, Canada	426		
Wind Facilities, Canada	375		
Calgary Corporate Office	3		
Solomon, WA, Australia	206261		

CC9.2c

Please break down your total gross global Scope 1 emissions by GHG type

GHG type	Scope 1 emissions (metric tonnes CO2e)
CO2	31729028
CH4	110480
N2O	201917
SF6	0

---

#### CC9.2d

Please break down your total gross global Scope 1 emissions by activity

Activity	Scope 1 emissions (metric tonnes CO2e)
Coal Fired Power Generation	28874303
Natural Gas Fired Power Generation	2959026
Coal Mining	84647
Coal Mining Operations	3768
Mining Vehicles	114883
Fleet Vehicles	4799

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#### Further Information

**Page: CC10. Scope 2 Emissions Breakdown - (1 Jan 2013 - 31 Dec 2013)**

---

#### CC10.1

Do you have Scope 2 emissions sources in more than one country?

Yes

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**CC10.1a**

**Please break down your total gross global Scope 2 emissions and energy consumption by country/region**

Country/Region	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
Canada	174408	0	208242	0
United States of America	12837	0	15565	0
Australia	34	0	28	0

---

**CC10.2**

**Please indicate which other Scope 2 emissions breakdowns you are able to provide (tick all that apply)**

- By business division
- By facility
- By activity

---

**CC10.2a**

**Please break down your total gross global Scope 2 emissions by business division**

<b>Business division</b>	<b>Scope 2 emissions, location based (metric tonnes CO2e)</b>	<b>Scope 2 emissions, market-based (metric tonnes CO2e)</b>
Coal	137945	0
Natural Gas	1347	0
Hydro	36541	0
Wind	1182	0
Corporate	10264	0

---

**CC10.2b**

**Please break down your total gross global Scope 2 emissions by facility**

<b>Facility</b>	<b>Scope 2 emissions, location based (metric tonnes CO2e)</b>	<b>Scope 2 emissions, market-based (metric tonnes CO2e)</b>
Sundance, AB, Canada	25998	0
Keephills, AB, Canada	15477	0
Keephills 3, AB, Canada	4477	0
Highvale, AB, Canada	79157	0
Fort Saskatchewan, AB, Canada	649	0
Mississauga, ON, Canada	111	0
Ottawa, ON, Canada	46	0
Windsor, ON, Canada	88	0
Sarnia, ON, Canada	443	0
Centralia, WA, USA	5583	0
Centralia, WA, USA	7254	0
Hydro Facilities, Canada	36541	0
Wind Facilities, Canada	1182	0

Facility	Scope 2 emissions, location based (metric tonnes CO2e)	Scope 2 emissions, market-based (metric tonnes CO2e)
Corporate, Calgary, Canada	10239	0
Corporate, Perth, Australia	24	0

### CC10.2c

Please break down your total gross global Scope 2 emissions by activity

Activity	Scope 2 emissions, location based (metric tonnes CO2e)	Scope 2 emissions, market-based (metric tonnes CO2e)
Building Operations	187280	0

### Further Information

Historical TransAlta 2013 scope 2 emissions were adjusted in 2016 to account for an emission factor error. Scope 2 emission totals were adjusted 0.1%

**Page: CC10. Scope 2 Emissions Breakdown - (1 Jan 2014 - 31 Dec 2014)**

### CC10.1

Do you have Scope 2 emissions sources in more than one country?

Yes

---

**CC10.1a**

Please break down your total gross global Scope 2 emissions and energy consumption by country/region

Country/Region	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
Canada	167491	0	226800	0
United States of America	14821	0	17971	0
Australia	36	0	30	

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**CC10.2**

Please indicate which other Scope 2 emissions breakdowns you are able to provide (tick all that apply)

By business division  
By facility  
By activity

---

**CC10.2a**

Please break down your total gross global Scope 2 emissions by business division

<b>Business division</b>	<b>Scope 2 emissions, location based (metric tonnes CO2e)</b>	<b>Scope 2 emissions, market-based (metric tonnes CO2e)</b>
Coal		0
Natural Gas		0
Hydro		0
Wind		0
Corporate		0

**CC10.2b**

**Please break down your total gross global Scope 2 emissions by facility**

<b>Facility</b>	<b>Scope 2 emissions, location based (metric tonnes CO2e)</b>	<b>Scope 2 emissions, market-based (metric tonnes CO2e)</b>
Sundance, AB, Canada	24927	0
Keephills, AB, Canada	15248	0
Keephills 3, AB, Canada	947	0
Highvale, AB, Canada	81406	0
Fort Saskatchewan, AB, Canada	669	0
Mississauga, ON, Canada	184	0
Ottawa, ON, Canada	2	0
Windsor, ON, Canada	90	0
Sarnia, ON, Canada	4332	0
Centralia, WA, USA	9865	0
Centralia, WA, USA	4956	0
Hydro Facilities, Canada	29712	0
Wind Facilities, Canada	446	0
Corporate, Calgary, Canada	9527	0

Facility	Scope 2 emissions, location based (metric tonnes CO2e)	Scope 2 emissions, market-based (metric tonnes CO2e)
Corporate, Perth, Australia	26	0

---

#### CC10.2c

Please break down your total gross global Scope 2 emissions by activity

Activity	Scope 2 emissions, location based (metric tonnes CO2e)	Scope 2 emissions, market-based (metric tonnes CO2e)
Building Operations	182349	0

---

#### Further Information

Historical TransAlta 2014 scope 2 emissions were adjusted in 2016 to account for an emission factor error. Scope 2 emission totals were adjusted 0.04%

**Page: CC10. Scope 2 Emissions Breakdown - (1 Jan 2015 - 31 Dec 2015)**

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#### CC10.1

Do you have Scope 2 emissions sources in more than one country?

Yes

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#### CC10.1a

Please break down your total gross global Scope 2 emissions and energy consumption by country/region

Country/Region	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
Canada	171276	0	202461	0
United States of America	15017	0	18208	0
Australia	97	0	91	0

**CC10.2**

Please indicate which other Scope 2 emissions breakdowns you are able to provide (tick all that apply)

- By business division
- By facility
- By activity

**CC10.2a**

Please break down your total gross global Scope 2 emissions by business division

Business division	Scope 2 emissions, location based (metric tonnes CO2e)	Scope 2 emissions, market-based (metric tonnes CO2e)
Coal	147254	0

<b>Business division</b>	<b>Scope 2 emissions, location based (metric tonnes CO2e)</b>	<b>Scope 2 emissions, market-based (metric tonnes CO2e)</b>
Natural Gas	18	0
Hydro	29776	0
Wind	142	0
Corporate	9201	0

---

**CC10.2b**

**Please break down your total gross global Scope 2 emissions by facility**

<b>Facility</b>	<b>Scope 2 emissions, location based (metric tonnes CO2e)</b>	<b>Scope 2 emissions, market-based (metric tonnes CO2e)</b>
Sundance, AB, Canada	27797	0
Keephills, AB, Canada	19149	0
Keephills 3, AB, Canada	4801	0
Highvale, AB, Canada	80220	0
Fort Saskatchewan, AB, Canada	0	0
Mississauga, ON, Canada	0	0
Ottawa, ON, Canada	0	0
Windsor, ON, Canada	0	0
Sarnia, ON, Canada	0	0
Centralia, WA, USA	10381	0
Centralia, WA, USA	4636	0
Hydro Facilities, Canada	29776	0
Wind Facilities, Canada	142	0
Corporate, Calgary, Canada	9121	0
Corporate, Perth, Australia	79	0

---

**CC10.2c**

Please break down your total gross global Scope 2 emissions by activity

Activity	Scope 2 emissions, location based (metric tonnes CO2e)	Scope 2 emissions, market-based (metric tonnes CO2e)
Building Operations	186390	0

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**Further Information**

Fort Saskatchewan, Mississauga, Ottawa, Windsor and Sarnia use electricity generated on site for operations use.

**Page: CC11. Energy**

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**CC11.1**

**What percentage of your total operational spend in the reporting year was on energy?**

More than 60% but less than or equal to 65%

---

**CC11.2**

**Please state how much heat, steam, and cooling in MWh your organization has purchased and consumed during the reporting year**

Energy type	Energy purchased and consumed (MWh)
Heat	17577
Steam	0
Cooling	0

---

**CC11.3**

**Please state how much fuel in MWh your organization has consumed (for energy purposes) during the reporting year**

150435520

---

**CC11.3a**

**Please complete the table by breaking down the total "Fuel" figure entered above by fuel type**

Fuels	MWh
Sub bituminous coal	132065871
Natural gas	17630473
Diesel/Gas oil	711136
Propane	1521
Kerosene	611
Diesel/Gas oil	12834
Motor gasoline	13075

---

**CC11.4**

Please provide details of the electricity, heat, steam or cooling amounts that were accounted at a low carbon emission factor in the market-based Scope 2 figure reported in CC8.3a

Basis for applying a low carbon emission factor	MWh consumed associated with low carbon electricity, heat, steam or cooling	Comment
No purchases or generation of low carbon electricity, heat, steam or cooling accounted with a low carbon emissions factor	0	However, we do create RECs and offsets from our renewable energy facilities for either sale to customers/partners or to offset our carbon emissions.

CC11.5

Please report how much electricity you produce in MWh, and how much electricity you consume in MWh

Total electricity consumed (MWh)	Consumed electricity that is purchased (MWh)	Total electricity produced (MWh)	Total renewable electricity produced (MWh)	Consumed renewable electricity that is produced by company (MWh)	Comment
220759	220759	40674000	4954000	0	We currently do not track station service at our plants, although some of our plants, in particular our natural gas generation facilities consume electricity produced on site.

Further Information

Page: CC12. Emissions Performance

CC12.1

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

Decreased

---

**CC12.1a**

Please 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

Reason	Emissions value (percentage)	Direction of change	Please explain and include calculation
Emissions reduction activities			
Divestment			
Acquisitions			
Mergers			
Change in output	8.12	Decrease	We decreased the amount of coal burn in our Centralia, Washington coal facility in 2015 due to low demand in the Pacific NW
Change in methodology			
Change in boundary			
Change in physical operating conditions			
Unidentified			
Other			

---

**CC12.1b**

Is your emissions performance calculations in CC12.1 and CC12.1a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

CC12.2

Please describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tonnes CO2e per unit currency total revenue

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator: Unit total revenue	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
32227815	metric tonnes CO2e	2267000000	Location-based	6.30	Increase	Decreased revenue of 14% in 2015 due to weak electricity prices.

CC12.3

Please provide any additional intensity (normalized) metrics that are appropriate to your business operations

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator	Metric denominator: Unit total	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
32227815	metric tonnes CO2e	full time equivalent (FTE) employee	2380	Location-based	7.56	Increase	We reduced our pool of employees in 2015 as part of a restructuring.

Further Information

CC13.1

Do you participate in any emissions trading schemes?

Yes

CC13.1a

Please complete the following table for each of the emission trading schemes in which you participate

Scheme name	Period for which data is supplied	Allowances allocated	Allowances purchased	Verified emissions in metric tonnes CO2e	Details of ownership
Alberta Emissions Trading Regulation	Thu 01 Jan 2015 - Thu 31 Dec 2015		150000	150000	Facilities we own and operate
California's Greenhouse Gas Cap and Trade Program	Thu 01 Jan 2015 - Thu 31 Dec 2015		50000		Facilities we own and operate

CC13.1b

What is your strategy for complying with the schemes in which you participate or anticipate participating?

One of the four pillars of TransAlta's climate change strategy is the "Development of emissions offsets portfolios to achieve emissions reductions at competitive costs". The procurement of carbon related compliance mechanisms is managed by the TransAlta trading group. The risk and oversight systems that TransAlta uses to manage participation in other commodity markets also apply to carbon schemes. The trading group purchases spot allowances and also participates in the futures market. In addition to sourcing compliance units from third parties, TransAlta also develops its own compliance units for the SGER (Alberta Emissions Trading Regulation) through the verification of wind offset credits. TransAlta made an early entry into the CDM market in 2004 by entering into a long term purchase

agreement for Certified Emission Reductions from a project in Chile. TransAlta closed off its participation in the project in 2013.

**CC13.2**

**Has your organization originated any project-based carbon credits or purchased any within the reporting period?**

Yes

**CC13.2a**

**Please provide details on the project-based carbon credits originated or purchased by your organization in the reporting period**

Credit origination or credit purchase	Project type	Project identification	Verified to which standard	Number of credits (metric tonnes of CO2e)	Number of credits (metric tonnes CO2e): Risk adjusted volume	Credits cancelled	Purpose, e.g. compliance
Credit origination	Wind	Ardenville Wind Farm Offset Project Blue Trail Wind Farm Offset Project Macleod Flats Wind Farm Offset Project Summerview & Waterton Wind Farm Offset Project Summerview II Wind Farm Offset Project	Other: AB SGER 139/2007	463424	463424	No	Voluntary Offsetting

**Further Information**

CC14.1

Please account for your organization’s Scope 3 emissions, disclosing and explaining any exclusions

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Purchased goods and services	Relevant, calculated	503607	GHG Protocol Quantis Scope 3 Evaluator	100.00%	Our accounting group provided our annual spend analysis in 2015 and the SD team was able to further categorize these by sector of purchase and enter these values in to the Quantis Scope 3 Evaluator.
Capital goods	Relevant, calculated	125458	GHG Protocol Quantis Scope 3 Evaluator	100.00%	Entered TransAlta capital good expenditures, based on sector of purchase, in to the GHG Protocol and Quantis Scope 3 calculator to derive scope 3 emissions from capital goods.
Fuel-and-energy-related activities (not included in Scope 1 or 2)	Relevant, calculated	343091	Used Alberta Environment emissions factors for extraction and production of gasoline, diesel, natural gas, propane and kerosene. Applied emission intensity (mining emissions/coal combusted) from our own coal mine in Alberta to derive coal extraction emissions for our US coal operations.	100.00%	TransAlta purchases natural gas for its gas power generation facilities. Gas extraction and production is included in this calculation. Emissions from coal extraction in AB are accounted for in scope 1, as we operate the mine adjacent to our coal facilities. The extraction of coal combusted 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 combusted in our plants. We also use diesel, gasoline for

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
					transportation requirements and propane and kerosene for heating. These have also been included.
Upstream transportation and distribution	Relevant, calculated	84207	Diesel usage from locomotives (delivering coal) multiplied by mobile combustion source diesel rail emission factors (taken from Environment Canada National Inventory Report – EPA emission factors not clear)	100.00%	Coal is transported in diesel locomotive freight trains from Montana and Wyoming to our Centralia coal power plant in Washington. Multiplied: average diesel usage per round trip * total trips (223 in 2015) * emission factors, to calculate scope 3 emissions from upstream transport of coal. 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 consider these to be negligible. Emissions from extraction and production of natural gas are calculated in 'Fuel and energy related activities'
Waste generated in operations	Relevant, calculated	2954	GHG Protocol Quantis Scope 3 Evaluator	100.00%	As part of our annual sustainability reporting we track all environmental expenditures, including waste management expenditures. The total was applied in the Scope 3 evaluator to derive an estimate of our waste emissions
Business travel	Relevant, calculated	599	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 & 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	100.00%	Travel provider provided this data and in addition we double this figure to account for internally booked flights (outside of our travel provider)

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			haul (>994 miles): 0.1770 kg CO2/passenger mile *disregard class of service Rail2 Intercity rail (Amtrak) 0.1909 kg CO2/ passenger mile		
Employee commuting	Relevant, calculated	2975	GHG Protocol Quantis Scope 3 Evaluator	100.00%	GHG Protocol Quantis Scope 3 tool takes total employee numbers and applies a methodology. Company size 1000-2500 employees.
Upstream leased assets	Not relevant, explanation provided	0		0.00%	TransAlta accounts for emissions from leased assets in its scope 2 emissions
Downstream transportation and distribution	Not relevant, explanation provided	0		0.00%	Our primary product, electricity, does not have downstream and distribution emissions. Transmission line loss emissions are accounted for in fuel and energy related activities
Processing of sold products	Not relevant, explanation provided	0		0.00%	Our primary product, electricity, is not processed. Fly ash, a by product, is also not processed but added directly to cement mixture
Use of sold products	Not relevant, explanation provided	0		0.00%	Not applicable, no additional GHG emissions from the use of electricity.
End of life treatment of sold products	Not relevant, explanation provided	0		0.00%	There is no end of life treatment required for our primary products: wholesale and retail electricity
Downstream leased assets	Not relevant, explanation provided	0		0.00%	TransAlta did not have any applicable downstream leased assets in operation in 2015
Franchises	Not relevant,	0		0.00%	TransAlta had no franchises in 2015

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
	explanation provided				
Investments	Relevant, calculated	5419578	Specified Gas Emitters Regulation methodology (AB carbon markets)	100.00%	GHG emissions from sites that we have a financial ownership percentage, but are not the operator. Data was not available for the Sheerness coal facility, hence this number is an estimate based on average emission over the past five years.
Other (upstream)	Not evaluated	0	No additional upstream exposure	0.00%	No additional upstream exposure
Other (downstream)	Not evaluated	0	No additional downstream exposure	0.00%	No additional downstream exposure

**CC14.2**

**Please indicate the verification/assurance status that applies to your reported Scope 3 emissions**

Third party verification or assurance process in place

**CC14.2a**

**Please provide further details of the verification/assurance undertaken, and attach the relevant statements**

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 3 emissions verified (%)
Annual process	Complete	Reasonable assurance		Assurance statements from our partners have not been made available, but reasonable assurance is complete pursuant to the SGER. These can be delivered upon request via our partners or please see the Suncor, ATCO or Capital Power submissions.	ISO14064-3	84

**CC14.3**

**Are you able to compare your Scope 3 emissions for the reporting year with those for the previous year for any sources?**

Yes

**CC14.3a**

**Please identify the reasons for any change in your Scope 3 emissions and for each of them specify how your emissions compare to the previous year**

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
Purchased goods & services	Other: Internal learning	118	Increase	Still working with our accounting team to make sure we have accurate monetary goods and services data to enter in to the quantis calculator
Capital goods	Other: Internal learning	65	Decrease	Overestimated capital spend vs standard spend in 2014
Fuel- and energy-related	Change in	4	Increase	Included gasoline, propane and kerosene in 2015.

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
activities (not included in Scopes 1 or 2)	boundary			
Upstream transportation & distribution	Change in physical operating conditions	33	Decrease	Our coal plant in Centralia ran less in 2015, due to weak demand for electricity in the Pacific NW. As a result we had less train supply of coal from Montana.
Waste generated in operations	Unidentified	0	No change	We use the quants calculator and there has been no significant change to waste management expenditure.
Business travel	Unidentified	40	Decrease	Travel reduced in 2015.
Employee commuting	Unidentified	0	No change	We use the quants calculator and there has been no significant change to our employee size.
Investments	Change in boundary	9	Increase	Revisions were made to 2014 scope 3 emission investments to allow for an error, which calculated 100% of of facility emission, not 50% of ownership exposure emissions. The subsequent increase in emission was due to increased exposure at one of JV facilities.

#### CC14.4

**Do you engage with any of the elements of your value chain on GHG emissions and climate change strategies? (Tick all that apply)**

Yes, our customers

#### CC14.4a

**Please give details of methods of engagement, your strategy for prioritizing engagement and measures of success**

i) TransAlta flows through costs of emissions reporting and compliance to customers in Alberta, under the terms of Power Purchase Arrangement (PPA). The PPA customers represent a large amount of TransAlta generation. Pursuant to the PPAs we have an obligation to limit the cost and environmental impact of our activities. Our Sustainable Development group tracks and forecasts emissions and emission intensity monthly, we do this through a monthly accrual process, which we send to the PPA customers. For example, for our coal operations we track the per cent of carbon content in coal (weekly - we send our coal to 3 different labs), coal burn

and generation. We are able to forecast (one month in advance) emissions and emission intensity and produce a monthly accrual to communicate with our PPA customers. This way they have an idea of how the plant is performing from an emissions perspective and how to budget accordingly. Our commercial group also works closely with our customers and are in constant communication.

ii) Success is measured by historical and forecast emission intensity (CO<sub>2</sub>e/MWh). If we are reducing the emission intensity of our operations, this means less cost for our customers and reduced emissions. There is incentive on both sides to reduce emission intensity. Success for TransAlta is also measured by customer satisfaction. If our customers are happy with the service we provide we view this as a success.

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#### CC14.4b

To give a sense of scale of this engagement, please give the number of suppliers with whom you are engaging and the proportion of your total spend that they represent

Number of suppliers	% of total spend (direct and indirect)	Comment
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#### CC14.4c

If you have data on your suppliers' GHG emissions and climate change strategies, please explain how you make use of that data

How you make use of the data	Please give details
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#### CC14.4d

Please explain why you do not engage with any elements of your value chain on GHG emissions and climate change strategies, and any plans you have to develop an engagement strategy in the future

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#### Further Information

**Module: Sign Off**

CC15.1

Please provide the following information for the person that has signed off (approved) your CDP climate change response

Name	Job title	Corresponding job category
Donald Wharton	Managing Director, Carbon Transition	Environment/Sustainability manager

Further Information

Module: Electric utilities

Page: EU0. Reference Dates

EU0.1

Please enter the dates for the periods for which you will be providing data. The years given as column headings in subsequent tables correspond to the "year ending" dates selected below. It is requested that you report emissions for: (i) the current reporting year; (ii) one other year of historical data (i.e. before the current reporting year); and, (iii) one year of forecasted data (beyond 2020 if possible).

Year ending	Date range
2015	Thu 01 Jan 2015 - Thu 31 Dec 2015
2014	Wed 01 Jan 2014 - Wed 31 Dec 2014

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**Further Information**

**Page: EU1. Global Totals by Year**

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**EU1.1**

In each column, please give a total figure for all the countries for which you will be providing data for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity (metric tonnes CO2e/MWh)
2015	8730	36870	32227815	0.86
2014	8707	39536	35074764	0.88

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**Further Information**

Production data is based on operational control MWh production.

**Page: EU2. Individual Country Profiles - Australia**

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**EU2.1**

**Please select the energy sources/fuels that you use to generate electricity in this country**

Oil & gas (excluding CCGT)  
CCGT

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**EU2.1a**

**Coal - hard**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
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**EU2.1b****Lignite**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
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**EU2.1c****Oil & gas (excluding CCGT)**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2014	425	1153	638339	0.55
2015	425	1503	920003	0.61

---

**EU2.1d**

**CCGT**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2014	150	0	0	0
2015	150	0	0	0

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**EU2.1e**

**Nuclear**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)

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**EU2.1f****Waste**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

<b>Year ending</b>	<b>Nameplate capacity (MW)</b>	<b>Production (GWh)</b>	<b>Absolute emissions (metric tonnes CO2e)</b>	<b>Emissions intensity (metric tonnes CO2e/MWh)</b>
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**EU2.1g****Hydro**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

<b>Year ending</b>	<b>Nameplate capacity (MW)</b>	<b>Production (GWh)</b>
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**EU2.1h****Other renewables**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)
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**EU2.1i**

**Other**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO <sub>2</sub> e)	Emissions intensity (metric tonnes CO <sub>2</sub> e/MWh)
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**EU2.1j**

**Solid biomass**

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO <sub>2</sub> e)	Emissions intensity (metric tonnes CO <sub>2</sub> e/MWh)
2014	0	0	0	0
2015	0	0	0	0

---

**EU2.1k****Total thermal including solid biomass**

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2014	575	1153	638339	0.55
2015	575	1503	920003	0.61

---

**EU2.1l****Total figures for this country**

Please enter total figures for this country for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes in CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2014	575	1153	638339	0.55
2015	575	1503	920003	0.61

---

**Further Information**

Sustainability data from our new Solomon facility was incorporated in 2015.

**EU2.1**

**Please select the energy sources/fuels that you use to generate electricity in this country**

- Lignite
  - Oil & gas (excluding CCGT)
  - CCGT
  - Hydro
  - Other renewables
- 

**EU2.1a**

**Coal - hard**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
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**EU2.1b**

**Lignite**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2014	3591	26243	24528866	1.07
2015	3591	21638	23081947	1.07

### EU2.1c

#### Oil & gas (excluding CCGT)

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2014	0	0	0	0
2015	54	913	372145	0.41

### EU2.1d

#### CCGT

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2014	1022	2873	1729314	0.60
2015	844	2840	1667107	0.59

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**EU2.1e**

**Nuclear**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)

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**EU2.1f**

**Waste**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)

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**EU2.1g**

## Hydro

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)
2014	914	1885
2015	926	1747

---

## EU2.1h

### Other renewables

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)
2014	1122	2769
2015	1185	2847

---

## EU2.1i

### Other

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
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### EU2.1j

#### Solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2014	0	0	0	0
2015	0	0	0	0

### EU2.1k

#### Total thermal including solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2014	4613	29971	26608	1.00

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2015	4489	25390	25121199	0.99

## EU2.11

### Total figures for this country

Please enter total figures for this country for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes in CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2014	6648	34625	26608	0.85
2015	6599	29984	25122001	0.84

## Further Information

**Page: EU2. Individual Country Profiles - United States of America**

## EU2.1

Please select the energy sources/fuels that you use to generate electricity in this country

Lignite  
Other renewables

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**EU2.1a****Coal - hard**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
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**EU2.1b****Lignite**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2014	1340	6684	7451265	1.11
2015	1340	5023	5796121	1.15

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**EU2.1c****Oil & gas (excluding CCGT)**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
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**EU2.1d**

**CCGT**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
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**EU2.1e**

**Nuclear**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)
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**EU2.1f**

**Waste**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
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**EU2.1g****Hydro**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)
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**EU2.1h****Other renewables**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)
2014	144	407

Year ending	Nameplate capacity (MW)	Production (GWh)
2015	215	359

#### EU2.1i

##### Other

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)

#### EU2.1j

##### Solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2014	0	0	0	0
2015	0	0	0	0

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**EU2.1k****Total thermal including solid biomass**

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2014	1340	6684	7451265	1.11
2015	1340	5023	5796121	1.15

---

**EU2.1l****Total figures for this country**

Please enter total figures for this country for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes in CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2014	1484	7091	7451265	1.05
2015	1555	5382	5796121	1.08

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**Further Information**

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**EU3.1**

In certain countries, e.g. Italy, the UK, the USA, electricity suppliers are required by regulation to incorporate a certain amount of renewable electricity in their energy mix. Is your organization subject to such regulatory requirements?

No

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**EU3.1a**

Please provide the scheme name, the regulatory obligation in terms of the percentage of renewable electricity sourced (both current and future obligations) and give your position in relation to meeting the required percentages

Scheme name	Current % obligation	Future % obligation	Date of future obligation	Position in relation to meeting obligations

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**Further Information**

**Page: EU4. Renewable Electricity Development**

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**EU4.1**

Please give the contribution of renewable electricity to your organization's EBITDA (Earnings Before Interest, Tax, Depreciation and Amortization) in the current reporting year in either monetary terms or as a percentage

Please give:	Monetary figure	%	Comment
Renewable electricity's contribution to EBITDA	249	24.00%	million

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**EU4.2**

Please give the projected contribution of renewable electricity to your organization's EBITDA at a given point in the future in either monetary terms or as a percentage

Please give:	Monetary figure	%	Year ending	Comment
Renewable electricity's contribution to EBITDA	316	28.00%	2016	million

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#### EU4.3

Please give the capital expenditure (capex) planned for the development of renewable electricity capacity in monetary terms and as a percentage of total capex planned for power generation in the current capex plan

Please give:	Monetary figure	%	End year of capex plan	Comment
Capex planned for renewable electricity development	0	0.00%	2015	

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#### Further Information

CDP