Covanta Energy Corporation - Climate Change 2021

C0. Introduction

C0.1

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

Covanta is a world leader in providing municipalities and corporate customers with sustainable waste and energy solutions. The Company's core business—operation and ownership of Waste-to-Energy (WTE) facilities—helps communities and businesses around the world convert millions of tons of waste (otherwise destined for landfills) into clean, renewable energy. These facilities reduce greenhouse gas (GHG) emissions, conserve land and complement recycling efforts.

Our Covanta Environmental Solutions business provides commercial and industrial waste clients a variety of sustainable waste management services, including consulting, logistics support, recycling and energy recovery services. Our expanded service offerings provide our clients with additional routes to meet their zero-waste, zero-waste-to-landfill and sustainability goals. As clients reduce, reuse, recycle and recover energy, they reduce environmental impacts associated with materials and waste in our society. Ultimately, we seek not only to divert materials from landfills, but also to find fully sustainable waste management solutions that consider economics and the environment.

Covanta also owns other waste management businesses, such as transfer stations, which broaden the geographic reach of our core facilities.

C0.2

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

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Reporting year	January 1 2020	December 31 2020	No	<Not Applicable>

C0.3

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

Canada
Ireland
Italy
United States of America

C0.4

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

USD

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.

Equity share

C1. Governance

C1.1

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

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Board-level committee	Our Board has direct oversight of our sustainability strategy. Specifically, as directed in the committee's charter, our Nominating and Governance Committee is responsible for review and oversight of sustainability and corporate social responsibility initiatives, performance, and reporting; and developments and trends regarding public policy affecting the Corporation domestically and internationally. Specifically with regard to climate, the committee assesses and reviews changes in public policies pertaining to climate, including the evolving development of cap & trade programs, and implementation of the EU's waste framework directive; progress on goals and targets pertaining to GHG emissions; and content of our corporate sustainability report, including that pertaining to addressing climate change. Climate-related issues are a fundamental part of our sustainability strategy and program. We have committed to a series of specific targets within our materials management goal with the explicit intent to reduce GHG emissions from the waste management sector.

C1.1b

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

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Scope of board-level oversight	Please explain
Scheduled – some meetings	Reviewing and guiding strategy Reviewing and guiding major plans of action Monitoring and overseeing progress against goals and targets for addressing climate-related issues	<Not Applicable>	At least twice annually, the Chief Sustainability Officer reviews pertinent aspects of the sustainability program with the Nominating and Governance committee, including with regard to climate change and GHG emissions. This regular interaction is important to ensure recognition of potential risks and opportunities regarding climate change. Specifically in 2020, for example, the discussion with the nominating and governance committee included a review of the 2019 sustainability report including climate related information and topics and a discussion of the strategy and results of discussions with Oregon legislators on the proposed carbon cap and trade bill.

C1.2

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

Name of the position(s) and/or committee(s)	Reporting line	Responsibility	Coverage of responsibility	Frequency of reporting to the board on climate-related issues
Chief Sustainability Officer (CSO)	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	Annually

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

The SVP / Chief Sustainability Officer (CSO) has overall responsibility for the entire sustainability program, including the assessment, management, and strategy development for climate related issues. The CSO reports both to the Chief Legal Consul / EVP and the Chief Operating Officer / EVP both of whom report directly to Covanta's CEO. Climate related issues are monitored by the retrospective departments consistent with the type of issue. For example, changes in legislative or regulatory policies pertaining to climate change are monitored by the Government Affairs group. Alternatively, exposure to physical climate risks are monitored by the maintenance group, which reports through the COO. In addition to climate change issues, the CSO is responsible for all elements of Covanta's sustainability program, Community Affairs, Environmental Compliance, Permitting, Government Affairs and environmental testing. The CSO position is identified as an Executive Officer in the company's annual report. The responsibilities of the position, as well as its dual-reporting to operations as well as legal, make it ideally suited to address risks and opportunities to climate change, as well as to coordinate the organizations' response.

Reporting to the CSO are the VP Environmental Compliance, Permitting and Sustainability; the Senior Directors and VP of the Government Affairs Team, the Director of Community Affairs, and the Director of Compliance Testing. Total staff is over twenty full-time employees. Specific responsibility for the sustainability program, encompassing all of its goals and programs, lies with the Senior Director of Sustainability, who reports to the CSO through the VP Environmental Compliance, Permitting and Sustainability.

C1.3

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

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

C1.3a

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

Entitled to incentive	Type of incentive	Activity inventivized	Comment
Environment/Sustainability manager	Monetary reward	Other (please specify) (Overall Management)	The company has assigned specific personnel to manage the company's progress and status regarding climate change and each of those individuals receives an annual bonus based on individual performance wherein their success in the area of climate change would be among the factors considered. Furthermore, specific individuals in the company are tasked with implementation of specific initiatives that, among other benefits, result in net GHG emissions reductions. These employees are also evaluated on their individual performance on these initiatives. These evaluations impact the employees' bonuses.
Management group	Monetary reward	Emissions reduction project	Covanta's Metal Management group has been tasked with the overall growth of our metals recovery efforts, including both the quantity and quality of metals recovered from the ash remaining after the combustion process. Covanta recovers approximately 600,000 tons of metal a year for recycling. The metals recovered for recycling save significant amount of GHG emissions. For each ton of aluminum recovered, for example, 10 tons of GHGs as CO2e are saved relative to manufacturing aluminum from raw materials. Covanta's Metal Management Group is responsible for a large share of the company's GHG emissions reduction initiatives.
Corporate executive team	Monetary reward	Please select	Covanta's WTE business achieves GHG reductions by diverting waste from landfilling. Targets pertaining to growth of the business, either same store growth or new facilities, results in incremental greater overall GHG emissions reductions. Members of the Covanta Executive team are specifically compensated, in part, for the growth in free cash flow that such growth would generate. Specifically, Covanta set a sustainability goal to "increase the amount of waste managed through energy recovery and other sustainable waste management operations by 10% relative to a 2014 baseline by the end of 2020.

C2. Risks and opportunities

C2.1

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

Yes

C2.1a

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

	From (years)	To (years)	Comment
Short-term	0	3	
Medium-term	3	5	
Long-term	5	20	

C2.1b

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

For purposes of determining risks and opportunities pertaining to climate change, we define substantive financial or strategic impact as impacts that could be expected to create a material financial impact consistent with relevant financial reporting and disclosure standards, impact our ability to operate our current facilities or pursue development opportunities, or create a significant change in the demand for our products or services.

C2.2

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

Value chain stage(s) covered
Direct operations
Upstream

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

Frequency of assessment
Annually

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

Description of process
Covanta's Risk Management team provides an annual update on enterprise risk to our Board. The last update was in September 2020. The update includes a heat map of key risks facing the organization. The resulting “heat map” mapping is based on senior management’s (all VP’s and above) thoughts regarding each risk. The senior management team evaluates each risk in terms of probability (likelihood), impact (severity) and velocity (timing). “Global Warming” was specifically enumerated on the list of evaluated risks in 2018; however, the effects of climate change were embedded in risk categories evaluated in 2020, including “Weather,” a subcategory of “Operational Risk” – the risk safe, uninterrupted operation of business is compromised due to unforeseen circumstances, including but not limited to mechanical breakdown, weather, fire, cyber breeches, etc…” Climate change is also identified within "Law & Policy risk," where changes to local and national policies designed to mitigate climate change could impact our operations. In addition to the annual enterprise risk process, we assess climate change risk for certain projects and activities. For example, decisions to mitigate, transfer, accept or control climate-related risks and to capitalize on opportunities are made by cross-functional teams including operations, sustainability, legal, environmental, business management, accounting, sales, and other groups as appropriate. Not all risks and opportunities will require all groups involved, instead, risk and opportunities are evaluated in an approach proportional to their potential impact , positive or negative, on the business and likelihood of occurrence. We determine potential impact through multi-year financial modelling. While each model will be tailored to the specific risk or opportunity, each model generally assesses potential exposures, the extent of our business affected, market dynamics, and mitigation cost. For example, the New York Independent System Operator's (NYISO’s) design of a Carbon Pricing Scheme for the Wholesale Power market represents a significant potential transition risk to waste-to-energy facilities in New York State. Covanta's exposure to this potential risk was reviewed by a team from legal, government affairs, sustainability, energy markets, and business management. The effort to mitigate the risk, consisting of an education effort with regulators and legislators, was developed by the same team, with input from our customers and clients who would be potentially impacted. A similar approach was taken in California with regard to its cap and trade program as well as the cap and trade program that was considered by the Oregon DEQ. In each case, our financial model focused on predicting the annual cost exposure due to the carbon pricing scheme. Critical to each evaluation is a comparison to the financial exposure expected to be borne by landfilling, our primary competitor for post-recycled solid waste management. As we operate in a competitive market with landfilling, it is the relative cost that ultimately affects our net financial exposure. In the specific example of the NYISO proposal, we assessed financial impact based on the CO2 intensity of WTE stack emissions relative to the marginal carbon intensity of each of the major grid nodes in NY State and the projected social cost of carbon under consideration by the NYISO. For forward projections, we assessed future changes in social cost of carbon and performed sensitivity analyses on potential changes in the waste stream that could result in a change in the carbon intensity of WTE electricity. Concurrently, we review quarterly our exposure to existing carbon pricing schemes as part of our Sarbanes-Oxley compliance process, determining appropriate reserves and/or accruals based on emissions modelling, regulatory requirements, and carbon price projections. We have also identified several transition opportunities, including the potential to generate carbon offset credits as well as increased interest in our services from businesses interested in reducing their GHG emissions, particularly their Scope 3 emissions. The decision to proceed with the development of carbon offset credits was made by the sustainability department, which led the effort together with our partner communities, together with our business management group. The decision-making process considered potential revenue, the disposition of environmental attributes per the current contract, costs to develop the offsets, and the potential to develop additional recognition for waste-to-energy (WTE) as a GHG mitigation technology. Decisions pertaining to physical risks are led by the facility and/or regional operations management with input and resources from corporate operations as appropriate. This decentralized approach takes into account the unique design characteristics (e.g. layout, elevation) and risks (e.g. projected rainfall amounts / wind speeds) of each facility and its location. For example, after the impacts on the Essex County facility as a result of Superstorm Sandy led to significant investment not only in the repair, but in the mitigation of future flooding risks.

Value chain stage(s) covered
Upstream

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

Frequency of assessment
Not defined

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

Description of process
While carbon costs imposed by policy will have the most direct impact, concerns over climate change could increase or decrease the demand for our products and services. Our business management team normally responsible for waste procurement is responsible for reviewing the impact of climate-related market changes in collaboration with our sustainability and government affairs team. Our approach is to develop estimated market prices, taking into account of variety of factors, including climate-related impacts and associated policies. We also evaluate the uneven application of such impacts on the waste market, to elucidate any disparities of impact on WTE versus landfilling. For example, Connecticut, New Jersey, and California have moved forward with policies to require diversion of organics from landfill to recycling options (e.g. composting, anaerobic digestion) for large-quantity generators of food waste. Our assessment of these market risks was multi-dimensional, and include a review of potential impact on tip fees (the price paid to Covanta for management of waste) and well as the potential opportunity from an investment in organics management infrastructure.

C2.2a

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

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	WTE is a net source of GHG mitigation relative to the business as usual practice of landfilling, as recognized by many international organizations and protocols, including the EU, U.S. EPA, and CDM methodologies. However, WTE facilities also have stack emissions of CO2 which can be subject to regulation if not viewed consistently against other forms of waste management (e.g. landfilling). Regulations can also impact our industry indirectly, by changing the types of wastes that are remaining after waste reduction and recycling efforts are exhausted. For example, during the reporting year, we specifically evaluated the allowance allocation provisions of California's GHG reporting program (AB32) for financial impacts on our WTE facilities in California and the European Union's new capacity market CO2 intensity limitations for WTE's ability to continue to sell into the European electricity capacity market.
Emerging regulation	Relevant, always included	WTE is a net source of GHG mitigation relative to the business as usual practice of landfilling, as recognized by many international organizations and protocols, including the EU, U.S. EPA, and CDM carbon offset methodologies. However, WTE facilities also have stack emissions of CO2 which can be subject to regulation if not viewed from a systemic level. Because of the potential exposure, we are constantly evaluating our exposure to emerging regulations, legislation, and policy. For example, in 2020, we closely assessed the potential impacts of New York State's Climate Leadership and Community Protection Act, including the NY Department of Environmental Conservation's proposed and adopted Statewide Greenhouse Gas Emission Limits regulation; New Jersey Department of Environmental Protection's GHG Monitoring and Reporting Rule; Virginia's Carbon Trading Rule; and the continued evolution of the circular economy package in the European Union.
Technology	Relevant, always included	Waste-to-energy (WTE) is a net source of GHG mitigation relative to the business as usual practice of landfilling, however, there are emerging technologies which could offer even more GHG-efficient means of managing wastes remaining after waste reduction and recycling efforts have been exhausted. To date, these technologies have not been proven to be practical and/or economic at scale. However, we keep abreast of technological development to evaluate risk to our business. Recently, the interest around replacement of fossil fuels for transportation has driven proposals for waste to liquid fuels conversion. In this specific area, current risk is low given low fuel pricing and technological challenges in conversion of a heterogeneous feed stock like waste into a liquid fuel. In 2020, our focused continued to be on the recovery of additional metals and materials from our ash stream. For example, in 2020, we engaged with eight different university and/or private enterprise teams which were awarded funding from the U.S. Department of Energy's Advanced Research Programs Agency - Energy's funding opportunities for Mining Incinerated Ash Disposal Streams (MIDAS) and Waste into X (WiX). Both funding opportunities advance the idea of a more circular economy, where the return of useful materials into the economy helps reduce overall GHG emissions.
Legal	Relevant, always included	We closely watch legal developments, particularly those related to attribution of damages to specific entities. While WTE is a source of carbon mitigation, legal precedent could impact how our industry is viewed. In 2020, we closely followed the Biomass Power Association's (BPA's) lawsuit to compel the U.S. EPA to advance renewable electricity under the renewable fuel standard (RFS). Such an action could help advance the use of sustainably sourced biomass, like the biogenic portion of MSW, to help provide electricity for electric cars.
Market	Relevant, always included	The market for the good and services we provide can change based on the perception of our technology, WTE, in helping to mitigate GHG emissions in the waste management sector. In addition, changes in products purchased and used by consumers and businesses that eventually wind up as waste can change based on climate initiatives. For example, NJ recently passed a bill to require large generators of food waste to divert food waste for composting and anaerobic digestion. While we don't anticipate commercial-scale diversion requirements to materially impact our business, requirements to divert residential food waste could reduce the demand for post-recycling waste management services and our traditional WTE facilities.
Reputation	Relevant, always included	Many of our customers rely on us to provide sustainable waste management services and a low carbon alternative to landfilling to municipal solid waste (MSW) and certain non-hazardous industrial, institutional, and commercial waste streams. However, some parties oppose the consideration of WTE in efforts to reduce the carbon intensity of waste management. For example, some proponents of Zero Waste efforts do not distinguish between landfilling and WTE despite international recognition of WTE as a source of GHG mitigation. Consequently, we closely evaluate reputation risks related to climate, and our role in helping reduce GHG emissions from the waste management sector. In addition, a growing recognition of the disproportionate burden faced by some environmental justice communities has caused increased attention to all air emissions sources, including WTE facilities. Failure to meet emissions limits or concerns of emissions of WTE facilities could impede future development. In 2020, we supported New Jersey's first-of-its-kind landmark Environmental Justice legislation, which aims to address cumulative environmental impacts in overburdened areas. We were the only corporation to advocate for its passage, by speaking on behalf of the bill in the state assembly, publicizing our support via ads, a website and op-eds.
Acute physical	Relevant, sometimes included	Covanta owns/operates a portfolio of relatively modern facilities, the oldest of which began operation in 1987. The facilities were built to modern hurricane standards and should be able to withstand these and other weather-related events. However, a few of our facilities in the United States are located on estuaries that could become affected by storm surge, and increased severity and frequency of storms can cause other disruptions to operations. Specific risks assessed include the disruption of local electrical grid requiring facility shut-down, disruption of supply chains in getting critical raw materials to the facility, and disruption of waste flows into the facility necessitating curtailment of operations.
Chronic physical	Relevant, sometimes included	Covanta owns/operates a portfolio of relatively modern facilities, the oldest of which began operation in 1987. The facilities were built to modern hurricane standards and should be able to withstand these and other weather-related events. Rising sea level attributable to climate change could become a long-term issue at several facilities; however, significant impacts are unlikely because the useful life of existing facilities would be expended by the time this phenomenon might result in sufficient sea level rise to impact these facilities. The more likely scenario is an increased risk in storm-related flooding. A few of our facilities in the United States are located on estuaries that could become affected by storm surge, and in fact did become effected during Hurricane Sandy that impacted the northeast during fall 2012. Impacted facilities were reviewed for the exposure of critical infrastructure (e.g. electrical switchgear, back-up generators) to flood waters. These risks are not reviewed for facilities that are not located in areas of flooding risk. However, new business development opportunities have been evaluated for increased flood risk.

C2.3

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

Yes

C2.3a

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

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Emerging regulation	Carbon pricing mechanisms

Primary potential financial impact

Increased direct costs

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

As is the case with all combustion, our facilities emit CO2, however WTE is recognized as creating net reductions in GHG emissions and is otherwise environmentally beneficial, because it: • avoids CO2 emissions from fossil fuel power plants; • avoids methane emissions from landfills; and • avoids GHG emissions from mining and processing metal because it recovers and recycles metals from waste. For policy makers at the local level who make decisions on sustainable waste management alternatives, we believe that using WTE instead of landfilling will result in significantly lower net GHG emissions, while also introducing more control over the cost of waste management and supply of local electrical power. We are actively engaged in encouraging policy makers at state and federal levels to enact legislation that supports WTE

as a superior choice for communities to avoid both the environmental harm caused by landfilling waste, and reduce local reliance on fossil fuels as a source of energy. Many of these same policy considerations apply equally to other renewable technologies. The extent to which such potential legislation and policy initiatives will affect our business will depend in part on whether WTE and our other renewable technologies are included within the range of clean technologies that could benefit from such legislation. Several jurisdictions are looking at carbon policies, including Oregon and Pennsylvania. New York passed the Climate Leadership and Community Protection Act in 2019 which will require significant reductions in GHG emissions in the state by 2050. Covanta has a significant presence in New York, currently operating six plants in the state. In 2020, the state continued the process of developing specific policies and regulations to implement the legislation. We are actively engaged in the regulatory development process, including through participation in a state-led waste sector working group by appointment by the state's environmental regulator. The State has recognized that the main source of GHG emissions from the waste sector is from methane via organic waste decomposition in landfills. Given WTE's international recognition as a means of reducing GHG emissions by avoiding methane from the waste management sector, we expect WTE facilities will have an important role to play in the transition to a net zero economy; however, the exact impact on our business in New York is uncertain at this time.

Time horizon
Medium-term

Likelihood
Very unlikely

Magnitude of impact
Medium

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

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
0

Potential financial impact figure – maximum (currency)
70000000

Explanation of financial impact figure
Prior to passage of the Climate Leadership and Community Protection Act, the New York Independent System Operator (NYISO) was developing a potential carbon pricing scheme to be implemented in the wholesale power markets. Despite WTE's recognized benefits relative to landfilling, NYISO's proposal had included WTE, but excluded landfills. While further development of the carbon pricing scheme has stalled in light of the new climate bill, an analysis of the NYISO's proposal revealed that the annual impact to the WTE industry in NY State could range from $50M - $70M / year, translating to a $17 - $24 / ton impact on solid waste disposal facilities. Such a financial impact would result in market pressures to increase landfilling, despite their higher lifecycle GHG emissions.

Cost of response to risk

Description of response and explanation of cost calculation
Our overwhelming priority in responding to this risk is to engage with policymakers to ensure that carbon policies are aligned with lifecycle GHG emissions associated with various means of waste management. Our engagement consists of meeting with policy officials and regulators, participation in research groups, including the Environmental Research and Education Foundation (EREF) and Waste-to-Energy Research and Technology Council (WTERT) that engage in GHG analysis of waste management options, and sustainability reporting. We have also committed to develop a Science-based Target (SBT) by 2022 to provide a long-range plan for how WTE fits within an overall goal to reduce GHG emissions from waste management. We anticipate that this SBT will help inform long-term policy planning to achieve state-level reductions in GHG emissions from the waste sector. We have also begun tracking the development of carbon capture and sequestration technologies that can be deployed at WTE facilities over the long-term.

Comment
Current costs of management of this risk are not significant relative to our normal costs of business.

Identifier
Risk 2

Where in the value chain does the risk driver occur?
Downstream

Risk type & Primary climate-related risk driver

Market	Changing customer behavior

Primary potential financial impact
Decreased revenues due to reduced demand for products and services

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

Company-specific description
The most effective means of reducing GHG emissions from solid waste management is to move up the waste management hierarchy, focused on recycling. Such a movement should be focused on diverting wastes from landfilling, as has effectively been done in the European Union. As demand for landfilling decreases, pricing for post-recycled solid waste management could decrease due to an overabundance of waste management capacity in the market. Balancing this effect are expected decreases in available landfill capacity, and the tremendous remaining opportunity in the United States for further landfill diversion – annually, the U.S. still landfills approximately 250 million tons of municipal solid waste per year. Despite the potential benefits of expanded recycling and landfill diversion, the market for post recycled waste management services remains very strong. Policies developed to date to reduce landfilling, including food waste diversion efforts in California and Connecticut have not had material impact on post-recycled waste disposal. In fact, despite its efforts to increase recycling and divert organics, landfills are growing their share of the waste market in California. Furthermore, we are working to educate policymakers on the dangers of not addressing excess landfill capacity as they look at means of diverting waste up the waste management hierarchy and the importance of aligning policies with the goals of the solid waste management hierarchy.

Time horizon
Medium-term

Likelihood
Unlikely

Magnitude of impact
Medium-low

Are you able to provide a potential financial impact figure?
No, we do not have this figure

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
We routinely model and project trends in waste pricing on company revenues. At this time, we do not expect a material impact on revenues from change in demand for our services.

Cost of response to risk

Description of response and explanation of cost calculation
We continue to engage with policy makers at the local, state, and federal levels to help design effective energy and waste policies that will encourage the use of MSW for electricity generation after recycling options have been exhausted. We also continue to engage to help design policies that provide a level playing field in the solid waste management sector on the basis of environmental impact. For example, we recently argued for the comparable treatment of waste-to-energy and landfilling under New Jersey's food waste diversion bill. Initial versions of the bill exempted landfills, despite published research revealing that landfills are the least preferable option for food waste management remaining after recycling, composting, and anaerobic digestion efforts. In addition, we are working to diversify our management options in responses to waste management requests for proposals. For example, in a recent proposal in Connecticut, we included an anaerobic digestion facility as part of a teamed approach to complement energy recovery. Such options will become increasingly important as communities and states seek ways to reduce GHG emissions from waste management. We are also commissioning a new total ash processing facility in Fairless Hills, PA that will further reduce environmental impacts, including lifecycle GHG emissions, from energy recovery by finding additional beneficial reuse options for materials removed from non-hazardous combustion ash.

Comment

Identifier
Risk 3

Where in the value chain does the risk driver occur?
Upstream

Risk type & Primary climate-related risk driver

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

Primary potential financial impact
Decreased revenues due to reduced production capacity

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

Company-specific description
Continued operation of our facilities can be subject to interruptions in the supply of waste. While storms can create additional wastes that need proper management, they can also disrupt transportation networks. Grid outages can prevent certain facilities not equipped with "black-start" capabilities from returning to operation.

Time horizon
Short-term

Likelihood
Likely

Magnitude of impact
Low

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

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
0

Potential financial impact figure – maximum (currency)
1000000

Explanation of financial impact figure
While we judge this risk to be likely, outages caused by grid failure or supply chain interruptions are generally of relatively short duration (hours to several days). Furthermore, there can be some opportunity to recover lost capacity by shifting planned outages or moving waste to other facilities in our network.

Cost of response to risk

Description of response and explanation of cost calculation
We have reviewed our facilities and identified certain opportunities to more quickly resume operations after an interruption. For example, we installed a water-tight bunker around the emergency generator used to restore start-up power at our Essex County facility to eliminate the need to have grid power before start-up. We are also pursuing opportunities to participate in micro-grid developments, such as in Camden County, NJ. Such opportunities can provide resilience to local infrastructure while providing mechanisms to disconnect from the power grid in times of electricity supply disruptions. A plant operating within a micro-grid would be less likely to suffer a prolonged outage induced by loss of local electrical supply. We evaluate opportunities to reduce this risk by assessing the potential loss of revenue from plant disruptions and capital cost requirements for micro-grid connections, black plant start capabilities, or other capital improvements.

Comment

C2.4

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

C2.4a

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

Identifier
Opp1

Where in the value chain does the opportunity occur?
Direct operations

Opportunity type
Products and services

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

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
WTE is a widely recognized source of GHG mitigation, both internationally and in the United States. As such, a properly designed carbon pricing policy (e.g. cap & trade, carbon tax) should result in a price signal that coincides with the GHG benefits of WTE relative to landfilling. Such an economic signal would improve WTE's cost competitiveness relative to landfills. This has already had an impact. Specifically, The U.K. and Ireland's efforts to comply with the EU's waste framework and landfill directives have led to development opportunities for Covanta in these markets. These two directives have been identified by the European Environmental Agency as drivers in the reduction of GHG emissions from the waste management sector. WTE facilities are not covered by the EU ETS and have been specifically incentivized by our EU policies, including the aforementioned directives. Covanta completed the Dublin, Ireland WTE facility in 2018. We have continued to allocate capital to projects in the U.K. consistent with the country's goals to divert waste from landfills. Construction is well underway at new WTE facilities at Rookery and Earls Gate and we reached financial close on the Newhurst facility in February 2020. The U.K. has committed to its plans to further reduce landfilling of waste modelled after the EU directives even under Brexit.

Time horizon
Medium-term

Likelihood
Virtually certain

Magnitude of impact
High

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

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
105000000

Potential financial impact figure – maximum (currency)
115000000

Explanation of financial impact figure
Quantification of the financial impact is based on the reported range of earnings before interest, taxes, depreciation, and amortization (EBITDA) for Covanta's proportional interest in the full operation at our UK and Ireland facilities as presented at a June 28th 2021 Investor Presentation at the Stifel Waste 360 Investor Summit. (see https://investors.covanta.com/download/June+2021+Investor+Presentation+-+Final.pdf)

Cost to realize opportunity
650000000

Strategy to realize opportunity and explanation of cost calculation
We currently have an active development pipeline of four facilities in the U.K. to capitalize on the opportunity presented by the U.K.'s implementation of the EU directive (which it has committed to even with Brexit). We continue to engage with policy makers at the local, state, and federal levels to help design effective GHG policies that will treat the waste management sector equitably and encourage waste management methods that reduce GHG emissions. For policy makers at the local level ho make decisions on sustainable waste management alternatives, we believe that using WTE instead of landfilling will result in significantly lower net GHG emissions, while also introducing more control over the cost of waste management and supply of local electrical power. We are actively engaged in encouraging policy makers at state and federal levels to enact legislation that supports WTE as a superior choice for communities to avoid both the environmental harm caused by landfilling waste, and reduce local reliance on fossil fuels as a source of energy.

Comment

Identifier
Opp2

Where in the value chain does the opportunity occur?
Downstream

Opportunity type
Products and services

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

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
In our Covanta Environmental Solutions (CES) business unit, many of our customers pursue our waste-to-energy (WTE) service offering as a way to divert wastes from landfills and, increasingly, reduce GHG emissions from waste management. We also offer other sustainable waste management services with low carbon footprints, including waste depackaging which allows for separate downstream use of the packaging (commonly recycled) and the packaged good (often treated, combusted for energy recovery, composted, or anaerobically digested).

Time horizon
Short-term

Likelihood
Virtually certain

Magnitude of impact
Medium

Are you able to provide a potential financial impact figure?
No, we do not have this figure

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
Zero landfill goals have been a significant driver in the growth of Covanta Environmental Solutions.

Cost to realize opportunity

Strategy to realize opportunity and explanation of cost calculation
In addition to our focus on WTE and related waste sourcing activities, we are seeking to expand our environmental service offerings through both organic growth and acquisitions. Specifically, we offer wastewater treatment, depackaging, and contracted composting services to help our customers further reduce their environmental footprint. We have also made a major $20M+ investment in our total ash processing system (TAPS) which will further reduce the ash residue requiring land disposal by recovering additional metal and aggregate products thereby further bolstering our customers' zero landfill claims and reducing lifecycle GHG emissions through additional material recycling. We have also reset our sustainability goal to increase total wastes avoided, recycled or reused under our management by 100% by 2022 relative to a 2014 baseline of 548,000 tons.

Comment

Identifier
Opp3

Where in the value chain does the opportunity occur?
Downstream

Opportunity type
Resilience

Primary climate-related opportunity driver
Resource substitutes/diversification

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
WTE facilities can be a resilient source of energy and waste management for communities. When weather and other natural events disrupt the grid, WTE facilities can remain operational, managing both routine waste and the resulting debris from those events, regardless of whether the grid is able to receive the power it can generate.

Time horizon
Medium-term

Likelihood
More likely than not

Magnitude of impact
Medium-low

Are you able to provide a potential financial impact figure?
No, we do not have this figure

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The variety of different possible project types make forecasting the financial impact difficult to determine, but the recognition of the role that waste-to-energy (WTE) facilities can play in community resiliency could have a material impact.

Cost to realize opportunity

Strategy to realize opportunity and explanation of cost calculation
Covanta is actively working with state and local policymakers to help develop opportunities where waste-to-energy facilities can help with community resiliency. For example, the New Jersey Board of Public Utilities is working to improve energy resiliency and emergency preparedness by establishing microgrids throughout the state. A microgrid is a group of interconnected loads and distributed energy resources that acts as a single controllable entity that can connect and disconnect from the grid.

Comment

C3. Business Strategy

C3.1

(C3.1) Have climate-related risks and opportunities influenced your organization's strategy and/or financial planning?
Yes, and we have developed a low-carbon transition plan

C3.1a

(C3.1a) Is your organization's low-carbon transition plan a scheduled resolution item at Annual General Meetings (AGMs)?

	Is your low-carbon transition plan a scheduled resolution item at AGMs?	Comment
Row 1	No, and we do not intend it to become a scheduled resolution item within the next two years	

C3.2

(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?
No, but we anticipate using qualitative and/or quantitative analysis in the next two years

C3.2b

(C3.2b) Why does your organization not use climate-related scenario analysis to inform its strategy?

We think that scenario analysis could be a very useful exercise to help demonstrate how more sustainable waste management, including the use of waste-to-energy for the materials remaining after recycling, could help meet climate change objectives, including limiting global warming to 2 degrees Celsius. Previously, we did not complete a climate-related scenario analysis because of the already recognized role of waste-to-energy (WTE) in reducing GHG emissions, including by CDM, CDP, and the World Economic Forum. In addition, we have already performed several analyses that have quantified the role that more sustainable waste management can play. In 2009, our engineers co-authored a paper that assessed how implementing the waste management hierarchy of the U.S. EPA and EU (i.e. in order of decreased preference: reduce, reuse, recycle, recover energy, disposal) to the extent proven by global leaders like Germany, Austria, and the Netherlands could reduce overall GHG emissions. The analysis found that by 2050, more sustainable waste management could reduce global GHG emissions by 1 Gigatonne of carbon equivalents per year (See Bahor *et al.,* Integrated waste management as a climate stabilization wedge, *Waste Management & Research*, 2009: 27: 839-849). However, the analysis did not relate those emissions reductions to a specific scenario, such as those referenced by CDP.

However, given the growing development of more quantitative scenarios, many of which include changes in key parameters of our own climate models (e.g. waste composition, methane GWP, electricity grid carbon intensity, metal manufacturing carbon intensity), we have determined that scenario analysis could help better inform our long-term business strategy with regard to business development opportunities and we plan to move forward in this area within the next two years. We expect to begin scenario analysis planning in conjunction with our commitment to develop a science-based target by 2022.

C3.3

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

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	The climate benefits of WTE have influenced our business objective and strategy. Providing sustainable waste, materials, and energy services to our customers is the cornerstone of our business. Each of our service offerings responds to customer demand for sustainable waste management services that are superior to landfilling according to the "waste hierarchy" and assists our customers in meeting their own zero-waste, zero-waste-to-landfill, circular economy, and other sustainability goals. These goals, and the waste management hierarchy itself, are designed to reduce the environmental impacts of waste management, including the emission of GHGs. As indicated above, each of our service offerings is focused on providing cost effective and sustainable solutions that leverage our extensive network of WTE facilities and transfer stations in North America. Our development of WTE projects in the U.K. and Dublin was, in part, founded on development of sustainable waste management infrastructure with a lower carbon intensity than landfilling. The UK continues to be a strong area of growth for Covanta and offers a case study in how countries can turn to WTE to lower emissions and boost low-carbon energy generation. In late 2020, two new UK projects reached financial close: the Newhurst Energy Recovery Facility in Leicestershire and Protos Energy Recovery Facility in Cheshire. Meanwhile, construction continues at our Earls Gate facility and a fourth site, The Rookery South Energy Recovery Facility (ERF) in Bedfordshire, is on track to begin commercial operations early in 2022. These new projects will help the UK achieve its goal of reducing methane emissions by diverting biodegradable waste from landfills.
Supply chain and/or value chain	Yes	While our primary business is recovering energy from waste, the recovery of metals from the ash remaining after the energy recovery process is becoming increasingly important to our business. The production of metals from raw materials is very GHG-intensive. As society moves toward a carbon constrained economy, we expect that the value of metals and other recoverable materials in our ash will increase. As such, we have invested heavily in equipment and technology to improve our metal recovery efficiency. In furtherance of that direction, we commenced start-up of our first Total Ash Processing System located in Fairless Hills, Pennsylvania, adjacent to our metal processing facility in 2020. This technology separates the combined ash from WTE facilities into its component parts enabling increased recycling of small metal fractions and the recovery of aggregate for reuse as construction material while reducing the volume of ash requiring landfill disposal. Recovery of additional metal for recycling helps reduce GHG emissions associated with production of metals from raw materials. The diversion of ash from landfilling also helps reduce the GHG impacts associated with transportation and the placement of ash in the landfill.
Investment in R&D	Yes	We have recently partnered with several university research teams in their proposals to secure funding through the U.S. Department of Energy's Advanced Research Program Agency – Energy (ARPA-e) to pursue advanced metal recovery and ash beneficial use. These technologies, if successful, will help recover additional metal for recycling, including precious and rare earth elements, resulting in further lifecycle GHG emissions reductions from materials management. Furthermore, use of ash as a potential cement replacement or admixture can help with cement decarbonization. In 2020, we also took more definitive steps to begin the consideration of carbon capture use and storage for WTE facilities including in the UK and the U.S. With 60-65% of the carbon in waste derived from biogenic sources, WTE offers a very attractive opportunity to help achieve net removals of carbon from the atmosphere though the capture and sequestration and/or use of biogenic carbon. In particular, waste sources of biomass are particularly attractive, as they do not contribute to land use change. As part of our efforts, we responded to a request for information, together with university and private partners, regarding carbon capture issued by the Electric Power Research Institute (EPRI).
Operations	Yes	We have, at several of our sites, implemented capital projects designed to harden critical infrastructure against flooding that is potentially exasperated by sea-level rise and/or the increased frequency of storm events. We have also made capital investments to help improve the ability of certain facilities to operate during periods of local grid outages. We anticipate that climate change could lead to increased intensity and duration of storm events that could make power disruptions more likely.

C3.4

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

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Capital expenditures Capital allocation Acquisitions and divestments Access to capital Assets	Our company's mission is to provide more sustainable waste management services. Increasingly, sustainable waste management is inextricably linked to reducing GHG emissions. As such, climate-related risks, and to an even greater extent, opportunities, have been a key factor in capital allocation, revenues, capital expenditures, acquisitions and divestitures, and assets. Furthermore, the recognition of WTE as a source of GHG mitigation has opened up sources of capital for us that may not have been accessible if we had been a more carbon-intensive industry. Our planning covers up to 5-10 years. Specifically, The U.K. and Ireland's efforts to comply with the EU's waste framework and landfill directives have led to development opportunities for Covanta in these markets. These two directives have been identified by the European Environmental Agency as drivers in the reduction of GHG emissions from the waste management sector. Covanta completed the Dublin, Ireland WTE facility in 2018. We have continued to allocate capital to projects in the U.K. consistent with the country's goals to divert waste from landfills. In late 2020, two new UK projects reached financial close: the Newhurst Energy Recovery Facility in Leicestershire and Protos Energy Recovery Facility in Cheshire. Meanwhile, construction continues at our Earls Gate facility and a fourth site, The Rookery South Energy Recovery Facility (ERF) in Bedfordshire, is on track to begin commercial operations early in 2022. These new projects will help the UK achieve its goal of reducing methane emissions by diverting biodegradable waste from landfills. We believe that the ability of WTE to reduce GHG emissions provides us access to additional sources of capital and investment in our business. The announcement of the acquisition of Covanta by EQT Infrastructure citied the sustainability and GHG benefits of the WTE technology relative to landfilling: "EQT and Covanta are proven business leaders who share a like-minded approach to environmental stewardship, and this acquisition aligns directly with EQT's thematic approach of investing in sustainable businesses that have a positive impact on society. "

C3.4a

(C3.4a) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).

C4. Targets and performance

C4.1

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

Intensity target

C4.1b

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

Target reference number
Int 1

Year target was set
2017

Target coverage
Company-wide

Scope(s) (or Scope 3 category)
Scope 3: Purchased goods & services

Intensity metric
Other, please specify (Metric tons CO2e per thousand short tons of MSW processed)

Base year
2016

Intensity figure in base year (metric tons CO2e per unit of activity)
10.35

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure
95

Target year
2022

Targeted reduction from base year (%)
10

Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]
9.315

% change anticipated in absolute Scope 1+2 emissions
0

% change anticipated in absolute Scope 3 emissions
-9.5

Intensity figure in reporting year (metric tons CO2e per unit of activity)
9.65

% of target achieved [auto-calculated]
67.6328502415458

Target status in reporting year
Underway

Is this a science-based target?
No, but we anticipate setting one in the next 2 years

Target ambition
<Not Applicable>

Please explain (including target coverage)
The Waste-to-energy (WTE) business is itself a source of GHG mitigation. Net Carbon offsets are achieved as a result of increased waste processed. An absolute target to reduce GHG emissions associated with raw material consumption would not be compatible with the overall goal to grow the business (which, given WTE's recognition as a source of GHG mitigation, results in overall GHG reductions). We set the goal as an intensity target to promote efficient raw material usage while increasing throughput, ultimately resulting in greater economy-wide GHG emissions.

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?
Target(s) to reduce methane emissions

C4.2b

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

Target reference number
Oth 1

Year target was set
2018

Target coverage
Company-wide

Target type: absolute or intensity
Absolute

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

Other, please specify	Other, please specify (Total wastes avoided, recycled or reused)

Target denominator (intensity targets only)
<Not Applicable>

Base year
2014

Figure or percentage in base year
548000

Target year
2022

Figure or percentage in target year
1096000

Figure or percentage in reporting year
999000

% of target achieved [auto-calculated]
82.2992700729927

Target status in reporting year
Underway

Is this target part of an emissions target?
Meeting this target helps us expand the low carbon waste management offerings we provide to our clients, both by expanded our service offerings to include wastewater treatment, waste depackaging, composting, and recycling, as well as recover additional metals from those wastes we receive for energy recovery. In general, recycling reduces GHG emissions relative to making new products from virgin materials and resources.

Is this target part of an overarching initiative?
Reduce short-lived climate pollutants

Please explain (including target coverage)
Goal is to Increase total wastes avoided, recycled, or reused under our management by 100% by 2022 relative to a 2014 baseline of 548,000 tons. This is an update to a previous goal, which was to achieve a 25% increase in wastes avoided by 2020. We met this earlier goal in 2016. Avoided wastes includes both metals that we recover from our combustion ash, as well as waste recycling, reuse, or avoidance services we offer to our clients. This is inclusive of, but not limited to, water pre-treatment, non-ferrous and ferrous metal recycling, and e-waste recycling. We anticipate further gains with the expansion of our Total Ash Processing System (TAPS), which will enable us to reduce the volume of ash requiring landfill disposal by as much as 65 percent. Waste reduction, reuse and recycling is recognized as generally reducing GHG emissions relative to both disposal (landfilling) and energy recovery.

Target reference number
Oth 2

Year target was set
2016

Target coverage
Company-wide

Target type: absolute or intensity
Absolute

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

Other, please specify	Other, please specify (Million short tons waste diverted from landfill)

Target denominator (intensity targets only)
<Not Applicable>

Base year
2014

Figure or percentage in base year
20.7

Target year
2020

Figure or percentage in target year
22.8

Figure or percentage in reporting year
21.3

% of target achieved [auto-calculated]
28.5714285714286

Target status in reporting year
Underway

Is this target part of an emissions target?
Diverting wastes from landfills will help reduce overall country and region GHG emissions from the waste management sector, particularly methane.

Is this target part of an overarching initiative?

Reduce short-lived climate pollutants

Please explain (including target coverage)
More sustainable waste and materials management can be a significant source of GHG emissions mitigation. Growing landfill diversion and moving up the waste hierarchy, both for our own operations and for our clients', are our most powerful drivers in reducing GHG emissions. By 2020, our target was to increase the amount of waste managed through energy recovery and other sustainable waste management operations by 10% relative to a 2014 baseline. Our U.K. pipeline will provide an additional 1.6 million tons, representing an 8% increase from the baseline. Please note that this goal was set on an "Operational Control" basis, which is a different framework than the "Equity Share" approach used in our CDP inventory.

C4.3

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

C4.3a

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

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	1	0
To be implemented*	0	0
Implementation commenced*	1	49700
Implemented*	1	52400
Not to be implemented	0	0

C4.3b

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

Initiative category & Initiative type

Waste reduction and material circularity	Product/component/material recycling

Estimated annual CO2e savings (metric tonnes CO2e)
52400

Scope(s)
Scope 3

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
3000000

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

Payback period
4-10 years

Estimated lifetime of the initiative
11-15 years

Comment
Our efforts to increase the amount of ferrous and non-ferrous metals recovered from the ash remaining after the combustion process for recycling continued in 2020. The initiative includes capital improvements, process optimization, and the use of a mobile ash processing system that can processes ash at smaller facilities where the installation of a stand-alone metals recovery system may not be economically viable. Additional ferrous and non-ferrous metals recovered for recycling reduces GHG emissions associated with the manufacturing of virgin metals from raw materials.

C4.3c

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

Method	Comment
Financial optimization calculations	Many of the GHG emissions reductions opportunities that are within our control are aligned with financial signals. A greater return on metals recovery projects that results from higher separation efficiency also optimizes lifecycle GHG emissions reductions.
Other	We have embarked on a rigorous Continuous Improvement program aimed at making our operations more efficient. Many of the opportunities for optimizing efficiency also reduce lifecycle GHG emissions.
Dedicated budget for other emissions reduction activities	Our Covanta Metals Management group was specifically created to identify and implement projects to recover additional metals from the ash remaining after the combustion process at our waste-to-energy facilities. These projects both create additional revenue for Covanta and generate lifecycle GHG emissions reductions as a result of the additional metal recovered for recycling. The use of recycled metal saves significant amounts of GHG emissions relative to using raw materials.

C4.5

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

Yes

C4.5a

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

Level of aggregation

Company-wide

Description of product/Group of products

Our core business, waste-to-energy, is widely recognized as a source of GHG mitigation. These facilities, and other like them around the world, are recognized internationally as a source of Greenhouse gas (GHG) emissions mitigation and low carbon energy generation, including by the U.S. EPA; U.S. EPA scientists; the Intergovernmental Panel on Climate Change (“IPCC”); the World Economic Forum; the European Union; CalRecycle; California Air Resources Board; and the Joint Institute for Strategic Energy Analysis (NREL). WTE facilities generate carbon offsets credits under both the Clean Development Mechanism (CDM) of the Kyoto Protocol and voluntary carbon offset markets. WTE was recognized as a compliance option for reducing GHG emissions from electricity generation in the final version of the Obama Administration's Clean Power Plan promulgated in 2015. New WTE facilities were eligible to generate Emission Rate Credits (ERCs). Existing facilities were not a covered source and were considered a source of zero carbon energy under the program.

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

Low-carbon product and avoided emissions

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

Other, please specify (Lifecycle methodology, USEPA MSW DST)

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

100

% of total portfolio value

<Not Applicable>

Asset classes/ product types

<Not Applicable>

Comment

On average, the U.S. EPA has determined that WTE facilities reduce GHG emissions by 1 ton of CO2 equivalents (CO2e) for every ton of municipal solid waste (MSW) diverted from landfill and processed. By eliminating emissions that would have otherwise occurred, WTE is the only major source of electricity that reduces GHG emissions. Furthermore, WTE can generate carbon offset credits under the Kyoto Protocol’s Clean Development Mechanism and the Verified Carbon Standard. Two U.S. WTE facilities, eligible due to their recent expansion, have sold carbon offset credits into the voluntary market. WTE was also eligible to generate emission rate credits under the Obama Administration's Clean Power Plan. WTE contributes to the reduction of GHGs in the environment by: - generating energy that otherwise would likely be generated by fossil-fueled facilities; - diverting solid waste from landfills where it would have emitted methane for decades, even when factoring in landfill gas collection; and - recovering metals for recycling, saving the GHGs and energy associated with the production of products and materials from virgin inputs.

C5. Emissions methodology

C5.1

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

Scope 1

Base year start
January 1 2011

Base year end
December 31 2011

Base year emissions (metric tons CO2e)
3955726

Comment

Scope 2 (location-based)

Base year start
January 1 2011

Base year end
December 31 2011

Base year emissions (metric tons CO2e)
26224

Comment

Scope 2 (market-based)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.
US EPA Center for Corporate Climate Leadership: Indirect Emissions From Purchased Electricity
US EPA Mandatory Greenhouse Gas Reporting Rule

C6. Emissions data

C6.1

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

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)
4378250

Start date
<Not Applicable>

End date
<Not Applicable>

Comment

C6.2

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

Row 1

Scope 2, location-based
We are reporting a Scope 2, location-based figure

Scope 2, market-based
We have operations where we are able to access electricity supplier emission factors or residual emissions factors, but are unable to report a Scope 2, market-based figure

Comment
Covanta generates electricity for export to the grid. However, we do, on occasion, purchase electricity from the grid to sustain operations during maintenance outages or for other purposes. Our 2020 purchased electricity was equivalent to 0.6% of our total gross electrical generation. For the location-based figure, we report using the average grid factors from U.S. EPA's eGRID tool which are a data-based set of emission factors for individual power control regions in the U.S. We are able to access public electricity supplier emissions factors in order to calculate the market-based figure, however, we do not have renewable contracts from our suppliers, as required by the CDP. We do not actively source renewable electricity because it is supplemental to our generation, making up less than a percent of our total gross generation.

C6.3

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

Reporting year

Scope 2, location-based
12453

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

Start date
<Not Applicable>

End date
<Not Applicable>

Comment

C6.4

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

C6.4a

(C6.4a) 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
Regional Offices

Relevance of Scope 1 emissions from this source
Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source
Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source (if applicable)
Emissions are not relevant

Explain why this source is excluded
An assessment of our Morristown corporate office, our largest office, found total Scope 1 and Scope 2 emissions to be approximately 0.01% of our total Scope 1 and Scope 2 emissions. Other offices are significantly smaller than our Morristown office. Furthermore, many of our remaining office locations are co-located with our operating facilities, where their GHG emissions are counted in the existing inventory as part of our operating facilities.

Source
HFCs and PFCs

Relevance of Scope 1 emissions from this source
Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source
No emissions from this source

Relevance of market-based Scope 2 emissions from this source (if applicable)
No emissions from this source

Explain why this source is excluded
A detailed review of facility-level GHG emissions completed in 2008 estimated emissions of HFCs and PFCs, predominately from the servicing of air conditioning equipment, to represent approximately 0.01% of our total Scope 1 GHG inventory. No changes have occurred to our operations since 2008 that would fundamentally change the magnitude of the expected emissions of HFCs and PFCs.

Source
SF6 Emissions

Relevance of Scope 1 emissions from this source
Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source
Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source (if applicable)
Emissions are not relevant

Explain why this source is excluded
Covanta has relatively minor emissions of SF6, predominately associated with high-voltage switchgear. A detailed review of facility-level GHG emissions completed in 2008 estimated emissions of SF6 to represent approximately 0.04% of our total Scope 1 GHG inventory. No changes have occurred to our operations since 2008 that would fundamentally change the magnitude of the expected emissions of SF6 and several facilities have replaced their SF6 switchgear with those equipped with other dielectric gases.

Source
Transfer Stations

Relevance of Scope 1 emissions from this source
Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source
Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source (if applicable)
Emissions are not relevant

Explain why this source is excluded
A detailed assessment of GHG emissions performed in several states as part of our earlier participation in The Climate Registry found that transfer station Scope 1 and Scope 2 GHG emissions represented 0.02% of total Scope 1 and Scope 2 GHG emissions. Exclusion of transfer station emissions is not expected to have a material impact on the inventory.

C6.5

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

Purchased goods and services

Evaluation status
Relevant, calculated

Metric tonnes CO2e
114900

Emissions calculation methodology
Calculation based on consumption of relevant raw materials, including lime, carbon, limestone, urea, ammonia, steel, and Inconel metal and published emission factor data. Emissions factors and sources: Lime= 0.768 ton CO2 / ton lime (source: NREL LCA Database) Carbon = 0.13 ton CO2 / ton GAC (source: CH2MHill Life Cycle Assessment of Greenhouse Gases for the Product: Amended Silicates) Limestone= 0.103 ton CO2 / ton limestone (source: University of TN Center for Clean Products (2008) Limestone Quarrying and Processing: A Life-Cycle Inventory) Urea= 0.002 ton CO2 / gal. urea (source: Kool et al (2012) GHG Emissions of N, P and K fertilizer production, Table 13) Ammonia= 2.56 ton CO2 / ton NH3 (source: Kool et al (2012) GHG Emissions of N, P and K fertilizer production, Table 13) Steel= 1.82 ton CO2 / ton steel tubing (source: ATHENA 2002) Inconel (average) = 5.86 ton CO2/ton Inconel (source: avg based on Inconel 600, 625, 718 emissions factors from SpecialMetals.com)

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
We base our emissions estimates based on actual quantities of materials used in the reporting year, or, if this data is not available, purchasing records.

Capital goods

Evaluation status
Relevant, calculated

Metric tonnes CO2e
80000

Emissions calculation methodology
The scope 3 emissions from capital goods have been found to represent a minor portion of total facility emissions. One study determined that about 7-14 kg CO2e per tonne of waste combusted over a facility's lifetime is associated with capital goods. (See L.K. Brogaard, C. Riber, T.H. Christensen. Quantifying capital goods for waste incineration, International Journal of Integrated Waste Management, Science and Technology, https://www.sciencedirect.com/science/article/pii/S0956053X13001232) In 2020, two of our four UK projects were under construction (Rookery and Earls Gate). Using the designed MSW / year for each facility, assuming that each facility will have a 30 year lifespan (as estimated in the study) and distributing the scope 3 emissions over the anticipated construction timeline, the scope 3 emissions from construction in 2020 were 80,000 MTCO2e.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
We estimate our emissions from capital goods based on emissions factors from peer reviewed studies.

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

Evaluation status
Relevant, calculated

Metric tonnes CO2e
39600

Emissions calculation methodology
Calculation based on upstream emissions from propane, diesel, and natural gas. Emissions factors are based on industry averages, pulled from the following sources: Propane = 0.05 ton CO2e / MWh (source: GTI (2017) GHG and Criteria Pollutant Emissions Analysis) Natural Gas = 0.05 ton CO2e / MWh (source: GTI (2017) GHG and Criteria Pollutant Emissions Analysis) Diesel = 0.07 ton CO2e / MWh (source: U.S. EPA (2020) Summary Lifecycle Analysis Greenhouse Gas Results for the U.S. Renewable Fuels Standard Program Version 1.1)

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
We estimate our emissions from upstream fuel related activities based on emissions factors used by the US EPA.

Upstream transportation and distribution

Evaluation status
Relevant, calculated

Metric tonnes CO2e
67300

Emissions calculation methodology
Calculation based on tons of waste processed (equity-share basis), average truck capacity of 13 tons, average transportation distance of 50 miles, and average emissions factor of 1.47 kg CO2e / vehicle-mile

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
In most cases, we do not have operational control over waste haulers who deliver MSW to our facility. In general, transportation is arranged by the waste generator. The resulting Scope 3 CO2e emissions represent about 20% of our Scope 3 emissions, but less than 2% of the total emissions (Scope 1, 2, and 3)

Waste generated in operations

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

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

Please explain
Covanta's primary business is management of waste in our waste-to-energy facilities. These operations generate an inert ash that is either beneficially used, placed in MSW landfills, or placed in ash monofills. Long term testing of leachate from an ash disposal facility in Marion County, Oregon revealed no detectable concentrations of semi-volatile organic compounds (SVOCs). (See Roffman, Haia K. Municipal Waste Combustion Ash Landfill Leachate Quality – Long Term Monitoring. Presented at the Air & Waste Management Association 90th Annual Meeting & Exhibition, June 8-13, 1997, Toronto, Canada) The absence of SVOCs supports the premise that minimal biological degradation of carbon, and subsequent evolution of methane, occurs with ash in landfills. Furthermore, ash was observed to solidify significantly in the monofill, likely rendering any remaining carbon in the ash unavailable to biological processes. Recent research has also identified municipal waste combustor ash as a slight GHG sink. (See Rendek, E., G. Ducom, P. Germain, Carbon dioxide sequestration in municipal solid waste incinerator (MSWI) bottom ash, Journal of Hazardous Materials, 128: 1, 73-79. doi:10.1016/j.jhazmat.2005.07.033)

Business travel

Evaluation status
Relevant, calculated

Metric tonnes CO2e
1900

Emissions calculation methodology
Emissions estimate provided by travel agency vendors for air, rental cars, and hotels.

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

Please explain
Emissions estimate provided by travel agency vendors for air, rental cars, and hotels.

Employee commuting

Evaluation status
Not relevant, calculated

Metric tonnes CO2e
5300

Emissions calculation methodology
In 2020, approximately 30% of our workforce worked remotely due to the global pandemic. On average our employees live 19 miles away from their place of work. An emissions factor of 3.98 x 10e-4 metric tons CO2e/mile is based of the EPA GHG calculator for passenger vehicles. Note that this is a conservative estimate which includes all Covanta employees, not an equity share basis.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
The resulting Scope 3 CO2e emissions are considered relevant.

Upstream leased assets

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

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

Please explain
Covanta does not have any appreciable upstream leased assets.

Downstream transportation and distribution

Evaluation status
Relevant, calculated

Metric tonnes CO2e
7000

Emissions calculation methodology
Calculation based on tons of ash processed, typical ash truck capacity of 20 tons, average transportation distance of 35 miles, and average emissions factor of 1.47 kg CO2e / vehicle-mile.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
Covanta's primary products / outputs are energy products in the form of steam and electricity. Any downstream losses associated with delivery of these products are already included in our scope 1 emissions. After the combustion process, approximately 10% of the initial volume of wastes processed remains as an inert ash which must be managed, either in a regular MSW landfill, as landfill daily cover, or in an ash monofill. These applications are typically located off-site. The scope 3 emissions associated with the ash transportation is calculated above.

Processing of sold products

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

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

Please explain
Covanta's sold products include electricity, steam and metals recovered for recycling. Steam and electricity are not subject to further processing, therefore, there are no emissions from processing of these products. Metals recovered for recycling generate GHGs during the recycling process; however, per the Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions, emissions from the processing of recycled inputs are allocated to the company that uses the recycled material.

Use of sold products

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

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

Please explain
Covanta's primary products are electricity, steam, and metals for recycling. The use of electricity and steam downstream does not generate emissions, although the processes in which these products are used may have different sources of emissions. Similarly, the metals sold for recycling are not finished products. They will likely be incorporated into other products that could have emissions in the use phase; however, those emissions would be attributable to a downstream manufacturer.

End of life treatment of sold products

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

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

Please explain
Covanta's primary products steam and electricity, do not require end of life treatment. The recovery of metals for recycling is further processed and the end of life emissions associated with the final product into which the recovered metal is used is not attributable to Covanta.

Downstream leased assets

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

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

Please explain
Covanta does not have downstream leased assets.

Franchises

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

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

Please explain
Covanta does not have franchises.

Investments

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

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

Please explain
Covanta does not have significant investments outside of equity investments in those facilities already included in our Scope 1 inventory.

Other (upstream)

Evaluation status
Not evaluated

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

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

Please explain

Other (downstream)

Evaluation status
Not evaluated

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

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

Please explain

C6.7

(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?
Yes

C6.7a

(C6.7a) Provide the emissions from biogenic carbon relevant to your organization in metric tons CO2.

	CO2 emissions from biogenic carbon (metric tons CO2)	Comment
Row 1	6371112	Covanta's biogenic CO2 emissions are derived from waste sources of biomass, widely recognized as nearly carbon neutral.

C6.10

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

Intensity figure
0.0023

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
4390703

Metric denominator
unit total revenue

Metric denominator: Unit total
1904000000

Scope 2 figure used
Location-based

% change from previous year
2.4

Direction of change
Decreased

Reason for change
Scope 1 & 2 emissions were down 0.6% in 2020 despite a slight increase in MSW processed. The decrease in intensity was mostly due to the 1.8% increase in annual revenue.

Intensity figure
1103

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
4390703

Metric denominator
full time equivalent (FTE) employee

Metric denominator: Unit total
3981

Scope 2 figure used
Location-based

% change from previous year
4.3

Direction of change
Decreased

Reason for change
Scope 1 & 2 emissions were down 0.6% in 2020 despite a slight increase in MSW processed. The decrease in intensity was mostly due to the 3.9% increase in full time employees.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?
Yes

C7.1a

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

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	4333090	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	43768	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	1393	IPCC Fourth Assessment Report (AR4 - 100 year)

C7.2

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

Country/Region	Scope 1 emissions (metric tons CO2e)
United States of America	4170687
Canada	535
Italy	6746
Ireland	200283

C7.3

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

By activity

C7.3c

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

Activity	Scope 1 emissions (metric tons CO2e)
Waste-to-Energy	4305692
Natural Gas Steam Generation	60847
Material Processing Facilities	3626
Waste Transportation	8085

C7.5

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

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted for in Scope 2 market-based approach (MWh)
United States of America	11959		35258	
Canada	220		875	
Italy	66		164	
Ireland	208		487	

C7.6

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

By activity

C7.6c

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

Activity	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Waste-to-Energy	10268	
Material Processing Facilities	2185	

C7.9

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

Decreased

C7.9a

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

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	32000	Decreased	0.7	As a waste services provider, we cannot control the properties of the waste we receive for energy recovery. Therefore, our energy recovery facilities are subject to variations in carbon content and the fraction of carbon that is derived from biogenic sources from year to year. From 2019 to 2020, we saw a decrease in the average fossil carbon intensity of the waste we processed at our WTE facilities. Fossil carbon intensity is determined by dividing total CO2 emissions by total tons processed, and multiplying by 12/44 to reflect the ratio of carbon to CO2. (-32,000/4,420,000)*100%= -0.7%
Other emissions reduction activities	2000	Decreased	0.05	Reduced Truck fleet travel in 2020 resulted in lower scope 1 emissions, based on an emissions factor of 1.5 kg CO2e / truck mile. (-2,000/4,420,000)*100%=0.05%
Divestment	0	No change	0	We did not have any divestments in 2020
Acquisitions	0	No change	0	We did not have any new acquisitions in 2020
Mergers	0	No change	0	We did not have any mergers in 2020
Change in output	8000	Increased	0.2	At continuing operations, MSW throughput increased by 24,000 tons on an equity share basis. Calculation based on average Scope 1 emissions per ton of MSW processed in 2020 multiplied by the increase in production. (8,000/4,420,000)*100%= +0.2%
Change in methodology	0	No change	0	Our Inventory calculation methodology has not changed from the previous year.
Change in boundary	0	No change	0	Our Inventory boundaries have not changed from the previous year.
Change in physical operating conditions	0	No change	0	No change in physical operating conditions.
Unidentified	0	No change	0	No other changes from the previous year
Other	300	Decreased	0.01	Reduced electric use at both our MSW and MPF facilities resulted in a lower scope 2 emissions (-9,500), while increased natural gas use at our Niagara Falls facility resulted in an increase in scope 2 emissions (+9,800). Therefore, (-300/4,420,000)*100% = 0.01%

C7.9b

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

Location-based

C8. Energy

C8.1

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

More than 0% but less than or equal to 5%

C8.2

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

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

C8.2a

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

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	18300556	16331501	34632057
Consumption of purchased or acquired electricity	<Not Applicable>	5481	31303	36783
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	0	<Not Applicable>	0
Total energy consumption	<Not Applicable>	18306037	16362803	34668840

C8.2b

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

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

C8.2c

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

Fuels (excluding feedstocks)
General Municipal Waste

Heating value
HHV (higher heating value)

Total fuel MWh consumed by the organization
33889919

MWh fuel consumed for self-generation of electricity
28460243

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration
5429677

Emission factor
91.95

Unit
kg CO2e per million Btu

Emissions factor source
U.S. EPA Greenhouse Gas Reporting Rule, 40 CFR 98, Tables C-1 and C-2

Comment
Approximately 50% of our Scope 1 emissions are measured using continuous emission rate monitors in accordance with the U.S. EPA GHG Reporting Program or other such similar program. We only use the emission factors presented here for those facilities or operations without continuous monitoring systems in place. As a consequence, our reported emissions will differ slightly from a calculation based on heat input times the emission factor provided above.

Fuels (excluding feedstocks)
Distillate Oil

Heating value
HHV (higher heating value)

Total fuel MWh consumed by the organization
74206

MWh fuel consumed for self-generation of electricity
71862

MWh fuel consumed for self-generation of heat
2343

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration
0

Emission factor
2.71

Unit
kg CO2e per liter

Emissions factor source
Converted from U.S. EPA Greenhouse Gas Reporting Rule, 40 CFR 98, Tables C-1 and C-2

Comment
Approximately 50% of our Scope 1 emissions are measured using continuous emission rate monitors in accordance with the U.S. EPA GHG Reporting Program or other such similar program. We only use the emission factors presented here for those facilities or operations without continuous monitoring systems in place. As a consequence, our reported emissions will differ slightly from a calculation based on heat input times the emission factor provided above.

Fuels (excluding feedstocks)
Natural Gas

Heating value
HHV (higher heating value)

Total fuel MWh consumed by the organization
649031

MWh fuel consumed for self-generation of electricity
118166

MWh fuel consumed for self-generation of heat
15746

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration
515118

Emission factor
0.056

Unit
metric tons CO2e per GJ

Emissions factor source
Converted from U.S. EPA Greenhouse Gas Reporting Rule, 40 CFR 98, Tables C-1 and C-2

Comment
Approximately 50% of our Scope 1 emissions are measured using continuous emission rate monitors in accordance with the U.S. EPA GHG Reporting Program or other such similar program (e.g. Ireland EPA). We only use the emission factors presented here for those facilities or operations without continuous monitoring systems in place. As a consequence, our reported emissions will differ slightly from a calculation based on heat input times the emission factor provided above.

Fuels (excluding feedstocks)
Propane Gas

Heating value
HHV (higher heating value)

Total fuel MWh consumed by the organization
18902

MWh fuel consumed for self-generation of electricity
18050

MWh fuel consumed for self-generation of heat
852

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration
0

Emission factor
0.067

Unit
metric tons CO2e per GJ

Emissions factor source
Converted from U.S. EPA Greenhouse Gas Reporting Rule, 40 CFR 98, Tables C-1 and C-2

Comment
Approximately 50% of our Scope 1 emissions are measured using continuous emission rate monitors in accordance with the U.S. EPA GHG Reporting Program or other such similar program. We only use the emission factors presented here for those facilities or operations without continuous monitoring systems in place. As a consequence, our reported emissions will differ slightly from a calculation based on heat input times the emission factor provided above.

C8.2d

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

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	6411935	869109	6299501	857160
Heat	0	0	0	0
Steam	2606426	0	2342089	0
Cooling	0	0	0	0

C9. Additional metrics

C9.1

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

C10. Verification

C10.1

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

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

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?
No, we do not verify any other climate-related information reported in our CDP disclosure

C11. Carbon pricing

C11.1

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

C11.1a

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.
California CaT - ETS
RGGI - ETS

C11.1b

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

California CaT

% of Scope 1 emissions covered by the ETS
2.3

% of Scope 2 emissions covered by the ETS
0

Period start date
January 1 2018

Period end date
December 31 2020

Allowances allocated
243929

Allowances purchased
62778

Verified Scope 1 emissions in metric tons CO2e
303867

Verified Scope 2 emissions in metric tons CO2e
0

Details of ownership
Facilities we own and operate

Comment
CA Cap & trade program compliance periods are 3 years, with the current period from 2018 - 2020. Answers to questions reflect the 3-yr period with the exception of the % of Scope 1 emissions covered by ETS, which reflects the 2020 emissions year only. The allowances were purchased in 2021 for the 2018-2020 period.

RGGI - ETS

% of Scope 1 emissions covered by the ETS
0.6

% of Scope 2 emissions covered by the ETS
0

Period start date
January 1 2020

Period end date
December 31 2020

Allowances allocated
0

Allowances purchased
25000

Verified Scope 1 emissions in metric tons CO2e
23571

Verified Scope 2 emissions in metric tons CO2e
0

Details of ownership
Facilities we own and operate

Comment
We operate one natural gas-fired boiler at our Niagara Falls, NY facility that is used as a back-up source of steam for an industrial park steam loop. While the use of the boiler is strictly to satisfy steam demand, the high-pressure output of the boiler is connected to a turbine which operates in a combined heat and power mode. Therefore, according to RGGI rules, all of the emissions from the boiler are subject to the program.

C11.1d

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

Covanta is subject to the RGGI cap and trade program for an auxiliary boiler installed at our Niagara Falls, NY facility. Our current strategy is to purchase allowances needed through the secondary market. Our core business, WTE, is not subject to the RGGI cap and trade program. Therefore, we currently have minimal market exposure to this program.

In 2017, Covanta was effectively exempt from the California cap and trade program under AB32; however, beginning in 2018, our Stanislaus County facility in Crows Landing, CA started to incur a compliance obligation. While the facility receives the majority of its allowances directly from the state as a free allocation, there is a shortfall of allowances provided relative to our compliance obligation. To make up the shortfall, we purchase either allowances, offsets, or offset derivative products from the secondary market.

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?
No

C11.3

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

C11.3a

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

Objective for implementing an internal carbon price
Navigate GHG regulations
Stakeholder expectations
Identify and seize low-carbon opportunities

GHG Scope
Scope 1

Application
We use the U.S. Federal Government's Social Cost of Carbon (2013) to demonstrate and communicate the economic benefits of landfill diversion and waste-to-energy with policy and decision makers.

Actual price(s) used (Currency /metric ton)
50

Variance of price(s) used
To date, we use a static, uniform price range, but anticipate moving toward evolutionary pricing over time. Given the uncertainty in the social cost of carbon, we use a range of $11 - $89 / metric tonne, reflecting range in 2010 Social Cost of Carbon from Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866, authored by the Interagency Working Group on Social Cost of Carbon, United States Government.

Type of internal carbon price
Shadow price

Impact & implication
Applying a cost of carbon has helped us demonstrate the economic efficiency of using waste-to-energy technologies to help mitigate climate change. In general, the operation of waste-to-energy plants is more expensive per ton of waste managed than landfilling. However, normal accounting practices do not account for the social cost of the higher GHG emissions from landfilling. Considering the social cost of carbon allows policymakers to better understand the relative cost of waste-to-energy and landfilling when the GHG externalities are considered.

C12. Engagement

C12.1

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

C12.1b

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

Type of engagement
Education/information sharing

Details of engagement
Share information about your products and relevant certification schemes (i.e. Energy STAR)

% of customers by number
100

% of customer - related Scope 3 emissions as reported in C6.5
0

Portfolio coverage (total or outstanding)
<Not Applicable>

Please explain the rationale for selecting this group of customers and scope of engagement
Many of our customers have an interest in the GHG emissions from their downstream waste management. Therefore, we make available to all of our customers information on climate change related to more sustainable waste management. The exact nature of the engagement varies depending on the client and can range from 1. assistance with lifecycle inventories and analysis, 2. development of GHG emissions savings metrics associated with operating milestones, 3. assistance with Scope 3 inventory development, 4. participation in employee and public meetings and hearings, 5. development of facility-specific websites to better educate the public (municipal customers) on the GHG and other environmental impacts of WTE, and 6. dissemination of technical information on climate change through our sustainability report, website, and white papers.

Impact of engagement, including measures of success
Educating our customers generally results in a more engaged relationship and collaboration on key issues related to GHG emissions, including state and federal policy design. We track website traffic metrics (e.g. time on page, unique users) and downloads of climate related reference materials to gauge efficacy and usage.

C12.3

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?
Direct engagement with policy makers
Trade associations
Funding research organizations

C12.3a

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

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Cap and trade	Support with minor exceptions	Direct engagement with policymakers and regulators in California (regulations for AB32), New York (Climate Leadership and Community Protection Act and associated regulations, NYISO carbon pricing scheme), Virginia RGGI development, and Oregon cap & trade legislation.	Covanta supports cap and trade programs as long as their design and scope provide for the recognition of waste-to-energy's well proven ability to mitigate GHG emissions or the relative lifecycle GHG emissions of WTE and landfilling. Specifically, we have argued for consistent treatment within the waste management sector. To date, many cap & trade programs in their early stages have excluded emissions from landfills, given that they are typically only modelled, and not measured. In contrast, because emissions from WTE facilities are readily measured, they are easier to include in inventories. This inequitable treatment results in an uneven playing field, and inadvertently penalizes WTE, even though it is internationally recognized as preferable to landfilling.
Clean energy generation	Support with minor exceptions	Direct engagement with policymakers and regulators including with renewable portfolio standard programs in Maryland and the capacity pricing mechanism in the European Union.	Covanta supports clean energy and renewable energy generation policies that include waste-to-energy technologies. For the European Union's carbon pricing mechanism, we argued that individual member states needed flexibility in assessing the carbon intensity of WTE facilities given their role in waste management and the potential conflict with policies designed to advance sustainable waste management goals.

C12.3b

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

C12.3c

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

Trade association
Energy Recovery Council

Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association's position
The Energy Recovery Council is active in communicating waste-to-energy's (WTE's) role as a key source of GHG mitigation and advocating for the proper treatment of WTE in state and federal policies in recognition of its benefits.

How have you influenced, or are you attempting to influence their position?
As a member of the Energy Recovery Council's board, we are involved in developing policy positions for the organization.

Trade association
Biomass Power Association

Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association's position
The Biomass Power Association (BPA) is actively involved in the legislative process, promoting biopower as an important addition to America's energy portfolio, and helping to shape government policies that encourage the development and use of biomass energy. BPA's advocacy efforts are vital as American policymakers at every level explore ways to reduce our nation's dependence on foreign oil, and reduce the greenhouse gas emissions that contribute to global warming.

How have you influenced, or are you attempting to influence their position?
As a member of the Biomass Power Association's board, we are involved in developing policy positions for the organization.

C12.3d

(C12.3d) Do you publicly disclose a list of all research organizations that you fund?
No

C12.3f

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

Covanta's direct and indirect activities that influence policy are coordinated through our Chief Sustainability Officer. In the corporate sustainability and government affairs departments, our policy positions pertaining to climate change are part of the department's core responsibilities. The Chief Sustainability Officer regularly (at least annually) updates the board's Nominating & Governance committee on key issues, including policy developments, related to climate change.

C12.4

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

Publication
In voluntary sustainability report

Status
Underway – previous year attached

Attach the document
2020 Updated-Covanta-CSR-Report-2019.pdf

Page/Section reference
Full report: http://covanta-csr.com/ Addressing Climate Change: http://covanta-csr.com/environment/addressing-climate-change/ Goals: http://covanta-csr.com/protectingtomorrow/progress-on-goals/ Data and emissions reporting: http://covanta-csr.com/data-pages/performance-tables/

Content elements
Governance
Emissions figures
Emission targets
Other metrics
Other, please specify (Sustainable waste management role in addressing climate change)

Comment

Publication
In mainstream reports

Status
Complete

Attach the document
CVA (Covanta Holding Corporation) (10-K) 2021-02-19.pdf_.pdf

Page/Section reference
See pg 5-6

Content elements
Strategy
Risks & opportunities

Comment

Publication
In mainstream reports

Status
Complete

Attach the document
CVA (Covanta Holding Corporation) (DEF 14A) 2021-04-02.pdf_.pdf

Page/Section reference
See pgs 8-13

Content elements
Governance
Strategy

Comment

C15. Signoff

C-FI

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

C15.1

(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Sr. Director, Sustainability	Environment/Sustainability manager

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

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

Please confirm below

I have read and accept the applicable Terms