

The Mosaic Company - Climate Change 2019

C0. Introduction

C0.1

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

The Mosaic Company is the world's leading producer and marketer of concentrated potash and phosphate crop nutrients. Our mission is to help the world grow the food it needs. The combination of our substantial company-owned mineral reserves, our production capacity, geographic locations and worldwide supply chain and distribution network differentiates Mosaic from other crop nutrient companies. Net sales for calendar year 2018 were approximately \$9.6 billion, representing sales of approximately 27.6 million tonnes of finished product. Our business engages in every phase of crop nutrition development, from the mining of resources to the production of crop nutrients, feed and industrial products for customers around the globe. Our customer base includes wholesalers, retail dealers and individual growers in approximately 40 countries.

At Mosaic, we think of sustainability broadly: as the ability to sustain our business, to prosper and deliver value to our myriad stakeholders over many years. Our sustainability targets, progress toward which we report annually, allow us to stretch for meaningful long-term improvements in the areas that are most important to our business.

Mosaic's Commitment on Climate Change acknowledges that global climate change creates uncertainty for our business and poses challenges for the health and well-being of the world's populations – ecologically, socially and economically. Mosaic remains a signatory to the United Nations Global Compact and we support its ten universal principles including human rights, labor, environment and anticorruption. In 2018, Mosaic was recognized in Corporate Responsibility Magazine's 100 Best Corporate Citizens List for the ninth consecutive year.

C0.2

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

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Row 1	January 1 2018	December 31 2018	No	<Not Applicable>

C0.3

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

- Brazil
- Canada
- Paraguay
- Peru
- 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 consolidation approach to your Scope 1 and Scope 2 greenhouse gas inventory.

Operational control

C-CH0.7

(C-CH0.7) Which part of the chemicals value chain does your organization operate in?

Row 1

Bulk organic chemicals

Please select

Bulk inorganic chemicals

Ammonia

Fertilizers

Other chemicals

Please select

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	The Environmental Health, Safety, and Sustainable Development Committee (EHSS Committee) of the Mosaic Board of Directors provides oversight of our environmental, health, safety and sustainable development (EHSS) strategic vision and performance, including the safety and health of employees and contractors; environmental performance; the systems and processes designed to manage EHSS risks, commitments, public responsibilities and compliance; relationships with and impact on communities with respect to EHSS matters; public policy and advocacy strategies related to EHSS issues; and achieving societal support of major projects. Climate-related issues are Mosaic's EHSS committee's responsibility because the subject matter is most closely aligned with this committee's expertise. Other committees of the Board may from time to time have input on climate-related issues.
Chief Executive Officer (CEO)	The Senior Leadership Team (SLT) consisting as of December 31, 2018 of the CEO, SVP and CFO, SVP - Phosphate, SVP - Potash, SVP and General Counsel, SVP – Brazil, SVP – Commercial, and SVP – Strategy and Growth, review the EHSS Committee's recommendations in order to develop new companywide policies, initiatives, targets and goals.

C1.1b

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

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – all meetings	<ul style="list-style-type: none"> Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding business plans Setting performance objectives Monitoring implementation and performance of objectives Overseeing major capital expenditures, acquisitions and divestitures 	<p>Mosaic's EHSS Committee receives updates about Mosaic's performance toward climate-related targets (GHGs and energy) at regularly scheduled quarterly meetings. In line with mechanism of reviewing and guiding strategy, the Board communicates with Mosaic's management team on the development and sign-off of climate-related targets (energy and GHGs). Because targets are an instrument through which Mosaic strives for companywide performance improvement in climate-related areas, the Board's reviewing and guiding our targets strategy directly contributes to oversight of these issues. The Committee is also regularly kept apprised of regulatory developments pertaining to the implementation of a carbon tax that impacts our Saskatchewan, Canada facilities.</p>

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)	Responsibility	Frequency of reporting to the board on climate-related issues
Other C-Suite Officer, please specify (VP EHS)	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
Other C-Suite Officer, please specify (VP Corp. Public Affairs)	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly

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).

Mosaic's Vice President of Environment, Health and Safety (VP EHS), a role that reports directly to Mosaic's Sr. VP Strategy and Growth, manages Mosaic's EHS strategy and development, including the company's performance toward climate-related sustainability targets (GHGs and energy). While climate-related responsibilities are shared by many at Mosaic, the VP EHS role has purview of these issues due to the interplay between companywide EHS performance and our progress toward our climate-related sustainability targets. The VP EHS also communicates regularly with a cross-functional working group that is responsible for managing and monitoring the status of a potential carbon tax that will impact our Saskatchewan, Canada facilities. The VP EHS communicates directly with Mosaic's EHSS Committee of the Board of Directors, providing quarterly updates on Mosaic's performance toward sustainability targets and regulatory developments pertaining to the implementation of the carbon tax in Saskatchewan. Mosaic's VP Corporate Public Affairs, a role that reports directly to our CEO, also has direct responsibility for assessing and managing climate-related risks and opportunities. Specifically, this role leads the function of sustainability and Mosaic's companywide sustainability strategy and development, including the creation, implementation and monitoring of climate-related targets (GHGs and energy); and the monitoring and communication of external climate issues that have the potential to impact Mosaic's business. These responsibilities rest with the VP of Corporate Public Affairs due to the need for broad, global perspective and extensive stakeholder engagement and reporting on these topics. Also, this role is well suited for managing the broad issues of sustainability, including climate change, because it interacts with and communicates heavily with the senior leadership team (SLT) and other senior leadership across geographies and business units at Mosaic.

C1.3

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

Yes

C1.3a

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

Who is entitled to benefit from these incentives?

Corporate executive team

Types of incentives

Monetary reward

Activity incentivized

Emissions reduction project

Comment

Performance measures for members of Mosaic's executive and management teams and all salaried employees are based on financial and operational performance, including operating earnings, operating costs per tonne, incentive selling, general and administrative expenses and safety. Climate change is indirectly linked to compensation through operating cost savings that are achieved through site-specific initiatives and companywide programs aimed at reducing energy use and emissions.

Who is entitled to benefit from these incentives?

Management group

Types of incentives

Monetary reward

Activity incentivized

Energy reduction project

Comment

As part of our strategic priority of developing, engaging and empowering our people, we have a performance management process called EDGE – Evaluating, Developing and Growing Excellence. Our performance management process has evolved to include scaled competencies, goal alignment and an emphasis on employee and career development. Management and employees at various levels can establish individual goals, including achievement of or progress towards energy reduction projects and/or targets, results of which are linked to their respective annual incentives.

C2. Risks and opportunities

C2.1

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

	From (years)	To (years)	Comment
Short-term	0	4	The short-term time horizon is generally aligned with Mosaic's general strategic planning horizons. Specifically, the five-year planning process is considered "medium-term" so the time period less than five years is considered "short-term."
Medium-term	5	9	The medium-term time horizon is generally aligned with Mosaic's general strategic planning horizons. Specifically, the company's five-year planning process is considered "medium-term."
Long-term	10	20	The long-term time horizon is generally aligned with Mosaic's general strategic planning horizons. Specifically, the company's five-year planning process is considered "medium-term" so the horizon beyond that, including the company's 2030 vision, is considered "long-term."

C2.2

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

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

C2.2a

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

	Frequency of monitoring	How far into the future are risks considered?	Comment
Row 1	Six-monthly or more frequently	>6 years	Mosaic's mission is to help the world grow the food it needs. As a company with operations and customers and farmers located throughout the world, we assess climate change risks and opportunities globally. Climate, including climate changes, and associated risks and opportunities are monitored regularly and the results are reported to the Board, the SLT and the EHSS Committee, and periodically to additional stakeholders through our annual sustainability disclosure. Climate change risks that could impact our business are reported on our Annual Report on Form 10-K and quarterly 10-Q reports. Mosaic considers risks and opportunities well into the future and understands that many of the impacts of climate change on our operations and those affecting our customers are uncertain.

C2.2b

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

Mosaic's mission is to help the world grow the food it needs. As a company with operations, customers and farmers located throughout the world, we assess climate change risks and opportunities globally. Climate risks such as changes in growing regions could affect Mosaic on a companywide level, whereas risks like hurricanes or adverse weather could affect Mosaic on an asset level. Climate, including climate changes, and associated risks and opportunities that apply at companywide and asset levels are monitored regularly by teams at Mosaic including EHS, public affairs, enterprise risk management and market analysis, and the results are reported to the Board, the SLT and the EHSS Committee of the Board of Directors, and periodically to additional stakeholders through our annual sustainability disclosure. Mosaic considers risks and opportunities well into the future and understands that many of the impacts of climate change on our operations and those affecting our customers are uncertain. We define "substantive impact" as an impact, financial or non-financial, that could hinder our ability to achieve our strategy, or one that threatens Mosaic's ability to sustain our business. More specifically, though our definition of substantive varies by timing and situation, an impact quantified at \$200 million would be considered substantive. Similarly, from a qualitative perspective, we would consider an impact substantive if it is an event a reasonable shareholder would consider when making an investment decision.

C2.2c

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

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Legal requirements and environmental regulations (driven by climate change) that Mosaic is subject to could adversely affect our business, financial condition and results of operations, and the results could be material to us. Accordingly, current regulatory risks are relevant to Mosaic's ongoing risk assessment process and are always included in Mosaic's broad consideration and analysis of climate-related risks. For example, future changes to air quality standards required us to start replacing catalysts at some of our Florida concentrates facilities in order to comply with new standards. Mosaic's EHS, public affairs and legal teams monitor and manage the risk of regulatory changes like these in an effort to strive toward compliance with requirements and standards while Mosaic's finance team coordinates cross-functionally with those groups to estimate the financial impact of such changes.
Emerging regulation	Relevant, always included	Mining and fertilizer manufacturing is an energy- and emissions-intensive endeavor and we are subject to complex laws and regulations. Accordingly, emerging climate regulations are relevant to Mosaic's ongoing risk assessment process and are always included in Mosaic's broad consideration and analysis of climate-related risks. For example, we are currently assessing potential effects of indirect costs from a carbon tax in Canada associated with energy and transportation that may be passed through to Mosaic. Similarly, we continue to monitor developments relating to environmental regulation (carbon tax) that impacts our Saskatchewan, Canada potash facilities. A cross-functional team made up of public affairs, legal, EHS, finance and operations colleagues at Mosaic is currently working with the Saskatchewan Ministry of Environment, Environment and Climate Change Canada, industrial associations and other government stakeholders to determine next steps for finalizing a regulatory and policy framework. We are also assessing the potential impacts of the proposed Clean Fuel Standard now under development by the federal government in Canada, which will apply to liquid, gaseous, and solid fuels.
Technology	Relevant, always included	Regulatory changes could require operational changes and/or installation of new technology. For example, we may be required to make investments in technology, including burner replacements and additional heat recovery systems, in order to meet new operational requirements. Mosaic's finance team coordinates cross-functionally with EHS, legal and operations groups to estimate the financial impact of such changes. Accordingly, these risks are relevant to us and are included in our consideration of climate-related risks.
Legal	Relevant, always included	Legal requirements and environmental regulations (driven by and/or related to climate change) that Mosaic is subject to could adversely affect our business, financial condition and results of operations, and the results could be material to us. Mosaic's legal team and EHS teams monitor these legal and regulatory developments regularly to determine the impact on Mosaic, operationally and financially. For example, there are laws and regulations that govern environmental controls and discharges to air. Changes to these laws could significantly affect our operating activities as well as the level of our operating costs and operating expenditures. Accordingly, these risks are relevant to Mosaic's ongoing risk assessment process and are always included in Mosaic's broad consideration and analysis of climate-related risks.
Market	Relevant, always included	Market risks are relevant to Mosaic's ongoing risk assessment process and they are always included in Mosaic's broad consideration and analysis of climate-related risks. Mosaic's market analysis team monitors climate and growing regions, forecasting for climate-related events like droughts and floods, to determine their potential impact on the markets and Mosaic's financial performance. For example, a widespread flood might impact agricultural commodity markets, which could in turn have an effect on Mosaic's annual sales.
Reputation	Relevant, always included	Reputational risks are relevant to Mosaic's ongoing risk assessment process and they are included in Mosaic's broad consideration and analysis of climate-related risks. For example, negative public perceptions of Mosaic or the fertilizer industry that are a result of climate-related issues could potentially lead to reduced demand for goods, reduced revenue, or could negatively impact our profit. Similarly, climate-related issues could prompt permitting challenges that affect Mosaic's license to operate. Mosaic's EHS, legal and public affairs team regularly monitors issues and reputational vulnerabilities, assessing inputs such as media coverage and stakeholder perceptions of issues affecting our business.
Acute physical	Relevant, always included	Acute physical risks are relevant to Mosaic's ongoing risk assessment process, and they are always included in Mosaic's broad consideration and analysis of climate-related risks. Mosaic's market analysis team monitors climate and growing regions, forecasting for climate-related events like droughts and floods, to determine their potential impact on the markets and Mosaic's business performance. Our engineering, EHS and operations teams also regularly monitor acute physical risks. For example, our Phosphates facilities have a rainfall preparedness plan that forecasts how each of our concentrates facilities will perform with 30-percent above-normal rainfall rates. The plan, updated annually prior to the start of peak rainfall season, models the impact of above-average rainfall on a site's storage capacity and defines a contingency plan and necessary actions to mitigate potential risks.
Chronic physical	Relevant, always included	Chronic physical risks are relevant to Mosaic's ongoing risk assessment process and they are always included in Mosaic's broad consideration and analysis of climate-related risk. For example, Mosaic has approximately \$7 billion in physical assets in hurricane-prone areas. Led by Mosaic's risk management group, we conduct annual property risk engineering assessments to identify and mitigate risk of loss associated with weather-related property damage and/or business interruption.
Upstream	Relevant, always included	Upstream risks are relevant to Mosaic's ongoing risk assessment process and they are always included in Mosaic's broad consideration and analysis of climate-related risks. For example, we rely on raw material inputs for our manufacturing process. Interference of our supply of those goods due to climate-related weather events could result in business interruption or reduced operational output. Mosaic's supply chain team closely monitors product supply and demand and any weather conditions or seasonal patterns that could interfere with our receipt of product inputs, like natural gas and/or sulfur.
Downstream	Relevant, sometimes included	Downstream risks are relevant to Mosaic's ongoing risk assessment process and they are sometimes included in Mosaic's broad consideration and analysis of climate-related risks. We consider potential downstream risks, like the risk of temperature volatility adversely impacting Mosaic's customers' ability to grow crops in certain areas around the world. Similarly, Mosaic's supply chain team closely monitors downstream transportation risks, such as the risk that weather conditions or seasonal patterns could interfere with products reaching our customers.

C2.2d

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

On a company level, Mosaic's EHSS Committee reviews and discusses policies regarding risk assessment and management, including sustainability issues and climate change, with management and an internal auditor. It is the responsibility of management to assess and manage the Company's exposure to risk and the EHSS Committee discusses and reviews guidelines and policies that govern the process. Discussion topics may include financial and reputational risk exposures and the steps management has taken to monitor and control such exposures. Mosaic's SLT addresses environmental risks and opportunities while defining priorities, needs and performance gaps across the company, which are presented to the Board and EHSS Committee regularly throughout the year. Mosaic's Enterprise Risk Management (ERM) Committee, consisting of a cross-functional team of senior leaders, meets biannually and assists in achieving business objectives through a systematic approach to anticipate, analyze and review material risks. Finally, Mosaic's EHS and Public Affairs professionals interact with policy makers and global thought leaders to encourage the transfer of knowledge and to bring the latest thinking on climate and sustainability into the Mosaic risk management process. At a facility level, Mosaic has an EHS Management system through which it sets EHS procedures and protocols for preventing, identifying and communicating risks. Our business segments are responsible for implementing day-to-day elements of our EHS program, assisted by an integrated staff of EHS professionals. We conduct audits to verify that each facility has identified risks, achieved regulatory compliance, implemented continuous EHS improvement and incorporated EHS management systems into day-to-day functions. We assess EHS risks with a "risk register" process that allows for the systematic identification, evaluation, ranking and elimination of EHS risks. Our Insurance & Risk Management department works with property insurance carriers to regularly conduct risk assessments to identify risks and make recommendations for mitigating the risk of loss associated with property damage and/or business interruption.

Priorities are set and decisions are made based on the assessment of the significance of the risk or opportunity, including the potential impact of the risk or opportunity as well as the probability of the risk or opportunity occurring.

As an example of a transition risk to which this process has been applied, a cross-functional team is assessing risk associated with the implementation of a carbon tax that will affect our potash facilities in Saskatchewan, Canada. Similarly, the team is assessing potential costs from the carbon tax associated with energy and transportation that may be passed through to Mosaic. In addition to working with the provincial and federal government to determine next steps for finalizing a regulatory and policy framework, we are assessing various scenarios under consideration and evaluating strategies that could help us reduce emissions. An opportunity we have applied this process to relates to our generation of virtually GHG-free cogenerated energy, which provides benefits to Mosaic in the form of cost savings and environmental performance improvements. Since 2015 we have prioritized opportunities to complete numerous cogeneration projects that improve the efficiency and output of our cogeneration assets, like installing a new turbine generator and adding a power line to increase our generation and internal use of cogenerated power. We manage opportunities like these by analyzing costs against potential benefits to our company, like cost savings, favorable reputation impacts, and efficiency or performance improvements.

As an example of a physical risk to which this process has been applied, Mosaic conducts annual property risk engineering assessments to identify risk exposures due to effects from extreme weather events, like wind, flood and storm surge. Those assessments result in recommendations for mitigating risks, which are prioritized based on criteria such as cost, likelihood of occurring and extent and type of impact. The types of actions that results from these assessments include improving existing flood and emergency response plans, replacing or redesigning roof structures to meet or exceed wind uplift requirements, and making enhancements to structures.

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

Transition risk

Primary climate-related risk driver

Policy and legal: Increased pricing of GHG emissions

Type of financial impact

Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

Various governmental initiatives to limit greenhouse gas emissions are under way or under consideration around the world. These initiatives could restrict Mosaic's operating activities, require us to make changes in our operating activities that would increase our operating costs, reduce our efficiency or limit our output, require us to make capital improvements to our facilities, increase our energy, raw material and transportation costs or limit their availability, or otherwise adversely affect our results of operations, liquidity or capital resources, and these effects could be material to us. Our Canadian potash mines, located in the Province of Saskatchewan, are subject to federal or provincial regulation that assigns a comprehensive tax on carbon emissions.

Time horizon

Short-term

Likelihood

About as likely as not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

10000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

One of the regulations currently in place in Saskatchewan includes a 5% reduction in intensity and applies a compliance cost of \$20 per unit of CO₂e generated above a specific threshold increasing to \$50 per unit by 2022. Assuming a tax of \$50 per unit of CO₂e, the annual cost to Mosaic could be over \$10 million. Note: This impact represents an estimate of the cost of compliance and anticipated indirect costs from suppliers.

Management method

Our Saskatchewan Potash facilities will continue to work with the Saskatchewan Ministry of Environment and Environment and Climate Change Canada, through participation in industry associations, to determine next steps. We will also continue to monitor developments relating to the anticipated proposed legislation, as well as the potential future effect on our operating activities, energy, raw material and transportation costs, results of operations, liquidity or capital resources. Broadly, Mosaic proactively emphasizes energy efficiency in our operations as one way to manage and/or mitigate the potential risks of regulatory changes that are driven by climate change. As a specific example of our management efforts, Mosaic's Potash business has been working in earnest to reduce energy and greenhouse gas emissions in order to mitigate the risk brought by regulatory changes. Cross functional teams, including a designated site lead who act as the facility's sustainability "eyes and ears", meet regularly to brainstorm projects that deliver energy and emissions improvements. As part of this work, in 2018, our Esterhazy facility converted the energy at a booster pump station from diesel to electric, which resulted in reduction of fuel use (800,000 liters) and reduced annual greenhouse gas emissions by more than 8,000 tonnes CO₂e. This project cost approximately \$900,000. There are other projects and approaches under consideration, costs for which vary drastically.

Cost of management

900000

Comment

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Technology: Costs to transition to lower emissions technology

Type of financial impact

Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

Environmental regulations (driven by climate change) that Mosaic is subject to could adversely affect our business, financial condition and results of operations, and the results could be material to us. There are various initiatives under consideration in the United States, Canada and internationally that, if adopted, could adversely affect our operating activities, energy, raw material and transportation costs, results of operations, liquidity or capital resources, and these effects could be material to us. For example, we have facilities in Saskatchewan, Canada that are affected by Canada's intended NDC, which aims to achieve, by 2030, an economy-wide target of reducing GHG emissions by 30% below 2005 levels. Similar initiatives could be adopted by the United States or Brazil. We are monitoring developments relating to the anticipated proposed legislation, as well as the potential future effect on our operating activities, energy, raw material and transportation costs, results of operations, liquidity or capital resources.

Time horizon

Long-term

Likelihood

About as likely as not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

100000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Any agreement, regulation or program that limits or taxes direct and indirect GHG emissions from our facilities could increase operating costs directly and through suppliers. In the United States and Brazil, hypothetical regulatory changes that required installation of technology such as burner replacements or additional heat recovery systems and related equipment could cost Mosaic more than \$100 million BRL (approximately \$250,000,000 USD). This cost example is based on approximate costs for a project under consideration in Brazil to upgrade heat recovery systems in order to maximize the amount of clean energy we cogenerate at our operations.

Management method

Broadly, Mosaic proactively emphasizes energy efficiency in our operations as one way to manage and/or mitigate the potential risks of climate-related regulatory changes and resulting potential changes in technology requirements. As a specific example of our management efforts, one of Mosaic's phosphate production facilities in Brazil undertook several process optimization projects that reduced fuel use and resulted in an approximate 20,000 tonnes CO₂e reduction. The costs for these initiatives totaled approximately \$65,000 and delivered annual savings of approximately \$3.5 million. There are other projects and approaches under consideration, costs for which vary drastically.

Cost of management

65000

Comment

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

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

Type of financial impact

Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

Mosaic has approximately \$7 billion in physical assets in hurricane-prone areas of Florida and Louisiana. Mosaic's insurance deductible for a covered wind event is, at a minimum, \$50 million per occurrence for mines and fertilizer production facilities in North America. Although our containments in these areas are built to withstand storms, additional sustained hurricane activity could force a change in design standards for buildings, equipment or containments. Similarly, a severe storm could cause damage that results in physical damage and/or business interruption. This could result in increased capital costs or costs per tonne of product.

Time horizon

Current

Likelihood

About as likely as not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

50000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Mosaic's insurance deductible for a covered wind event is, at a minimum, \$50 million per occurrence for mines and fertilizer production facilities in North America. Although our containments are built to withstand storms, additional sustained hurricane activity could force a change in design standards for buildings, equipment or containments. This could result in increased capital costs or costs per tonne of product. In the event of widespread damage as a result of a severe storm, we may face costs up to or exceeding our insurance deductible of \$50 million.

Management method

We manage these potential climate change risks by focusing on hurricane preparedness at all facilities that are within the zone of risk. Each site's preparation process includes the establishment of procedures and guidelines for the direction, control, and coordination for securing, shutdown, safe evacuation (if required), and the orderly restoration of plant operations in the event of a storm. These procedures and guidelines were in place in 2018 during summer hurricane season, which affects our facilities in Florida and Louisiana; similarly, we employed these procedures in 2017 in anticipation of Hurricane Irma, which hit Florida as a Category 2 storm. We also conduct property risk engineering assessments on an ongoing basis to address risk identifying and mitigating risks associated with property damage and business interruption. The types of actions that results from these assessments include improving existing flood and emergency response plans, replacing or redesigning roof structures to meet or exceed wind uplift requirements, and making enhancements to structures. The approximate cost of installing fasteners to secure roof panels as a way to reduce and/or avoid damage from hurricanes is 150,000. This exact cost example is based on a project we completed in 2017 at one of our distribution facilities. The costs associated replacing or redesigning roof structures and making enhancements to structures vary widely.

Cost of management

150000

Comment

Identifier

Risk 4

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

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

Type of financial impact

Reduced revenues from lower sales/output

Company- specific description

Mosaic uses freshwater in our mining and production processes. Changes in precipitation resulting in droughts or water shortages in our operating geographies across North and South America could restrict our operating activities, require us to make changes in our operating activities that would increase our operating costs, reduce our efficiency or limit our output.

Time horizon

Medium-term

Likelihood

Unlikely

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

96000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Mosaic's 2018 net sales totaled approximately \$9.6 billion. A theoretical decrease in production output that resulted in 1% lower sales companywide could translate to approximately \$96 million less revenue based on 2018 performance.

Management method

We are committed to responsible water use. We manage these potential climate change risk of extreme changes in precipitation patterns by recycling high percentages of the water used in our operations and by exploring the use of alternative water sources like reclaimed water, where possible. We have also invested in reverse osmosis (RO) technology, which reduces our reliance on freshwater resources. For example, as part of their larger water conservation efforts, Mosaic's Bartow facility uses reverse osmosis to produce approximately 500 gallons per minute of treated water back for use at the facility's sulfuric acid plant, thereby reducing freshwater needs by the same amount. It cost approximately \$7 million to run the reverse osmosis plant at our Bartow facility in 2018. Savings from reduced reagent use (achieved as a result of using RO) for that period were approximately \$500,000.

Cost of management

7000000

Comment**Identifier**

Risk 5

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

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

Type of financial impact

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

Company- specific description

Potential climate change risks that contribute to adverse and increasingly severe weather conditions, including the impact of potential hurricanes, floods and excess rainfall could have a negative impact on Mosaic. For example, an extreme weather event could interfere with our receipt of key production inputs, like natural gas, which could result in interruption of our operations, or we may have difficulty getting our product to customers. Similarly, increasingly severe storms could damage our facilities, which might cause a loss of Mosaic's production and/or an increase in operating costs.

Time horizon

Short-term

Likelihood

About as likely as not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

5000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

As an example of one potential impact, based on average production levels, if Mosaic's Faustina, Louisiana plant were shut down for a week and production could not be diverted to another facility, quantifiable business interruption costs could be approximately \$5 million.

Management method

We manage these potential climate change risks by engaging Mosaic's supply chain team to closely monitor product supply and demand and any weather conditions or seasonal patterns/risks (potentially climate change-related) that could interfere with our receipt of raw material inputs or with products reaching our customers. As an example of one solution we have implemented to manage this risk is to transport finished product inventory early, in anticipation of possible suspension of river traffic due to intense weather later in the season. This scenario could result in increased inventory storage expenses of \$275 per day per barge. As a theoretical example, in the event of such an event, if we send 50 barges for one month (30 days) additional costs would be approximately \$412,500.

Cost of management

412500

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

Energy source

Primary climate-related opportunity driver

Use of supportive policy incentives

Type of financial impact

Returns on investment in low-emission technology

Company-specific description

Various proposed legislation in the United States and Brazil that promotes and incentivizes clean energy production (which reduces greenhouse gas emissions) could provide Mosaic tax incentives and/or fairer pricing for surplus electricity that Mosaic supplies to local utility grids. As an example, Mosaic would benefit from tax incentives and/or fairer pricing for surplus electricity that Mosaic supplied in 2018, specifically in Florida, where we provided nearly 200,000 MWh to the local grid.

Time horizon

Short-term

Likelihood

Unlikely

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

10000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

In 2018, Mosaic produced approximately 1.6 million MWh of electrical energy from cogenerated electricity in our Phosphates business unit, and sent approximately 200,000 MWh to the local grid. In this business unit alone, the potential positive impacts (tax incentives and/or fairer pricing) of energy legislation could be upwards of \$10 million.

Strategy to realize opportunity

In order to manage this opportunity, Mosaic has been actively involved in dialogues at the legislative and executive branch levels, engaging on issues such as fairer pricing for the power we export to the utility grid, tax credits, and incentives to encourage the production of clean power. Internally, Mosaic continuously looks for opportunities to improve the efficiency and expand the output of our cogeneration assets. As a specific example of our management efforts, in 2016, Mosaic brought another turbo generator online at our Uncle Sam facility that is expected to provide an additional 15 megawatts of low-GHG electrical generation capacity. This initiative cost approximately \$21 million. A power line connecting our South Pierce and South Pasture facilities, installed in 2016 at a price of \$14 million, has allowed Mosaic to increase its internal use of cogenerated electricity. In 2018 we produced 1.6 million MWh of cogeneration, approximately 87% of which we consumed internally. The cost of engaging policymakers is not available as a separate line item. The investment in cogeneration examples cited above were in the range of \$14-21 million. We are reporting a cost of \$14 million for this opportunity as this is the cost for Mosaic's most recent investment in cogeneration. Other cogeneration projects are under consideration, costs for which vary widely.

Cost to realize opportunity

14000000

Comment

Identifier

Opp2

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Markets

Primary climate-related opportunity driver

Access to new markets

Type of financial impact

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

Company-specific description

Fertilizers like the ones Mosaic produces help produce up to 50% of crop yields. Considering that the world will have to feed nine billion people by 2050, it is easy to see the importance of properly used mineral fertilizers in reducing future greenhouse gas emissions and preventing further deforestation. As the number of people to feed in the world increases, Mosaic has an opportunity in the form of increased demand for existing products and services like our premium product line, MicroEssentials®, which has been shown to increase corn yields an average of 7.2 bushels per acre, or 4.3%, compared to traditional fertilizer due to product benefits such as uniform nutrient distribution.

Time horizon

Long-term

Likelihood

About as likely as not

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

79000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

If international pressure on regulation to improve fertilizer yields occurred, then Mosaic's production of MicroEssentials® as a percentage of total production may be further improved. Mosaic can potentially command a premium price and higher margins for our higher-yield products, potentially resulting in an overall increase of our gross margin as a percent of net sales. Therefore, this change in production percentage for higher-yield products like MicroEssentials® could have a positive effect on our operating results and financial condition. A hypothetical 2% increase in gross margin as a percentage of Phosphates Business Segment net sales, based on 2018 performance, would equate to approximately \$79 million.

Strategy to realize opportunity

In order to manage the potential opportunity of higher demand for Mosaic's premium products, we have established relationships with key universities around the globe to develop and test high-yield premium products, like MicroEssentials®. In 2018, Mosaic invested more than \$1,000,000 in one such partnership with a university-based Fertilizer Technology and Research Centre. To further respond to and manage this opportunity, Mosaic has invested in expansion projects to increase MicroEssentials® production capacity. In 2014, Mosaic announced plans to expand MicroEssentials® capacity, adding an incremental 1.2 million tonnes and bringing our total capacity to 3.5 million tonnes in 2017. In 2018 we had record sales volumes of 2.9 million tonnes of MicroEssentials®.

Cost to realize opportunity

1000000

Comment

Identifier

Opp3

Where in the value chain does the opportunity occur?

Customer

Opportunity type

Products and services

Primary climate-related opportunity driver

Shift in consumer preferences

Type of financial impact

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

Company-specific description

Changes in the length of growing seasons in certain regions, like northern Europe, may increase the productivity (and therefore planting demand) of some crops. This change could result in increased demand for Mosaic's higher-yield products like MicroEssentials®, and the increased demand could have a positive effect on our operating results and financial condition. The effects could be significant to us.

Time horizon

Long-term

Likelihood

About as likely as not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

131000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Our Phosphates segment had record sales of approximately 2.9 million tonnes of MicroEssentials® during 2018. A hypothetical increase of 10% in sales volume of MicroEssentials® from 2018 levels could result in over \$131 million in additional sales (calculated by using the average selling price per tonne, FOB destination, per our 2018 Form 10-K).

Strategy to realize opportunity

Mosaic's balanced approach to crop nutrition is a strategy to manage potential opportunities driven by the effects of climate change, such as change in temperature and the length of growing season. Mosaic has established relationships with key universities and research organizations around the globe to develop and test innovative products like our MicroEssentials® line, which features crop nutrient blends specially designed for the soils of various parts of the world. In 2018 we conducted 305 small plot trials in Argentina, Australia, Brazil, Chile, China, Canada, India, Latin America (Mexico to Peru) and the United States. Further, Mosaic established and continues to fund a university-based Fertilizer Technology and Research Centre, which focuses on soil chemistry and fertilizer technology, and utilizes the latest technology to develop innovative fertilizer formulations to improve nutrient use efficiency in a variety of climates. Our investment in this centre in 2018 totaled more than \$1,000,000.

Cost to realize opportunity

1000000

Comment

C2.5

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

	Impact	Description
Products and services	Impacted	In 2018 operating results were unfavorably impacted by high water levels in the Mississippi River which resulted in approximately 8,000 tonnes of lost production in Louisiana. The estimated financial impact of this lost production was approximately \$3.5 million (calculated by using the average finished product price of \$431 for the three months ended March 31, 2018). This impact on our production is considered to be low magnitude.
Supply chain and/or value chain	Impacted for some suppliers, facilities, or product lines	Our joint venture (JV) operation of the Miski Mayo mine in the Bayovar region of Peru was negatively impacted by flooding in the region in 2017. Phosphate rock from the JV operations supplements our overall phosphate rock needs. As a result of flooding, supply of phosphate rock from the JV was interrupted and we had to seek alternative sources of phosphate rock. The financial impact of this supply disruption was approximately \$3 million in 2017. Note: these costs are an estimation of the incremental costs of purchasing rock from another supplier to supplement what we would have otherwise received from the Miski Mayo mine. This is not an estimation of the full financial impact associated with the flooding event. In 2018 operating results were unfavorably impacted by high water levels in the Mississippi River, which resulted in approximately 8,000 tonnes of lost production in Louisiana. Specifically, our ability to transport product inputs from one facility to the other was affected, and the rate at which we could ship finished product was diminished due to high water levels in the Mississippi River. The estimated financial impact of lost production was approximately \$3.5 million (calculated by using the average finished product price of \$431 for the three months ended March 31, 2018). This impact on our supply chain is considered to be low magnitude.
Adaptation and mitigation activities	Impacted for some suppliers, facilities, or product lines	We have more than \$7 billion in physical assets in hurricane prone areas. We conduct property risk engineering assessments on an ongoing basis to identify and mitigate risks associated with property damage and business interruption. The types of actions that results from these assessments include improving existing flood and emergency response plans, replacing or redesigning roof structures to meet or exceed wind uplift requirements, and making enhancements to structures to protect from increased risk of severe weather events caused by climate changes As an example of the cost associated with one such project, the cost to adapt a roof structure with fasteners to withstand high winds in 2017 was approximately \$150,000. The impact of this particular instance of adaptation is considered to be low magnitude.
Investment in R&D	Impacted	Mosaic has established relationships with key universities and research organizations around the globe to develop and test innovative products like our MicroEssentials® line. Mosaic invests in research partnerships that focus on soil chemistry and fertilizer technology and use the latest technology to develop innovative fertilizer formulations to improve nutrient use efficiency in a variety of climate regimes, which could potentially allow for growing crops in increasingly difficult growing conditions. As an example of one of our R&D activities, we invested approximately \$1,000,000 in a university-based Fertilizer Technology and Research Centre in 2018. The impact of this particular instance of R&D is considered to be low magnitude. The cost of our total R&D activities is not available as an individual line item.
Operations	Impacted	In 2017 sales volumes were unfavorably impacted by Hurricane Irma which resulted in delayed and lost sales and lost production in Florida. We also sustained approximately \$7 million worth of property damage at one of our product warehouses. The impact of Hurricane Irma in 2018 is considered to be moderate magnitude. In 2018 operating results were unfavorably impacted by high water levels in the Mississippi River which resulted in approximately 8,000 tonnes of lost production in Louisiana. Specifically, our ability to transport product inputs from one facility to the other was affected, and the rate at which we could ship finished product was diminished due to high water levels in the Mississippi River. The estimated financial impact of lost production was approximately \$3.5 million (calculated by using the average finished product price of \$431 for the three months ended March 31, 2018). This impact on our operations is considered to be low magnitude.
Other, please specify	Not evaluated	

C2.6

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

	Relevance	Description
Revenues	Impacted	As part of our annual financial planning process, Mosaic's market analysis team monitors climate and growing regions, forecasting for climate-related events like droughts, floods and severe weather events, to determine their potential impact on the markets, our production (which translates to revenue) and Mosaic's overall financial performance. For example, a widespread flood might impact agricultural commodity markets, which could in turn have an effect on Mosaic's annual sales. In 2018 operating results were unfavorably impacted by high water levels in the Mississippi River which resulted in approximately 8,000 tonnes of lost production in Louisiana. Specifically, our ability to transport finished product inputs from one facility to the other was affected, and the rate at which we could ship finished product was diminished due to high water levels in the Mississippi River. Expressed in terms of revenue, the estimated financial impact of the lost production was approximately \$3.5 million (calculated by using the average finished product price of \$431 for the three months ended March 31, 2018). This impact on our revenues is considered to be low magnitude.
Operating costs	Impacted	As part of our annual financial planning process, we consider environmental, health and safety laws and regulations, some of which are climate-related, and their effect(s) on operating costs and capital expenditures. Severe climate-related events, including hurricanes, have in the past, and may in the future, adversely affect our operations, resulting in increased costs or decreased production. These impacts are part of our broad financial planning process. Mosaic's market analysis team monitors climate and growing regions, forecasting for climate-related events like droughts, floods and severe weather events, to determine their potential impact on the markets, our production (which translates to revenue) and Mosaic's overall financial performance. As another example that will have an impact on our operating costs, Mosaic is assessing the potential financial implications of federal and provincial carbon tax scenarios under consideration in Canada. Our evaluation is considering the operating cost impacts of direct energy consumption as well as indirect impacts of how the tax is passed on to Mosaic from third parties. Various scenarios are still under consideration and the effects of these potential tax scenarios could have a significant financial impact on us. In 2019 we began to see price increases for electricity consumption at our Saskatchewan facilities as a result of these changing regulations. We will quantify those impacts in next year's response. This impact on our operating costs is considered to be moderate magnitude.
Capital expenditures / capital allocation	Not yet impacted	As part of our annual financial planning process, we consider environmental, health and safety laws and regulations, some of which are climate-related, and their affect(s) on operating costs and capital expenditures. We also consider availability of capital expenditures for projects that could improve our environmental performance, including energy or GHG efficiency. As an example, Mosaic is assessing changes in emission allowances that should be effective by 2023 that will have an impact on some of our Phosphate concentrate facilities. Current equipment will not meet emissions requirements and we have initiated projects requiring capital expenditures to replace or upgrade catalysts at the affected facilities. The approximate cost per catalyst replacement is \$2 million and these planned costs, as well as the timeline for replacing the catalysts, are part of Mosaic's capital expenditures planning process. As another example, Mosaic is assessing changes in boiler emission allowances that will be effective in 2026 that will have significant impact on one of our Saskatchewan potash mines. Current boilers will not meet emissions requirements and we are exploring options, including equipment alterations that would require capital investments, in order to meet compliance standards. A capital project team has been assembled to conduct detailed analyses to assess solutions and the potential cost implications, but based on preliminary estimates, the financial impact could be more than \$75 million. This impact on our capital expenditures is considered to be high magnitude. Moreover, these costs impact Mosaic's ability to remain competitive against other global fertilizer and mining companies that operate in lower-cost jurisdictions without similar carbon tax and/or environmental costs.
Acquisitions and divestments	Not impacted	At this time, our identified risks related to climate change have not had an impact on our company's acquisitions and divestments. As part of the due diligence process leading up to our late 2017 acquisition of Vale Fertilizantes in Brazil, we considered the environmental performance, including GHG emissions footprint of facilities in the target company's portfolio. The financial impact of our ultimate decision cannot be estimated as an individual line item.
Access to capital	Not impacted	At this time, our identified risks related to climate change have not had an impact on our company's access to capital. Mosaic understands that climate-related issues can have an impact on a company's credit score, which could, in turn, impact their access to capital. We are employing adaptation and mitigation strategies and regularly engaging financial stakeholders in order to minimize and/or avoid such impacts.
Assets	Impacted	Severe storms, including hurricanes, have in the past, and may in the future, adversely affect our operations, resulting in damage to operating assets, increased costs or decreased production. These impacts are part of our broad financial planning process. In 2017, several of our facilities (operating assets) sustained damage as a result of Hurricane Irma, specifically a product warehouse that resulted in approximately \$7 million incurred for repairs/replacement. As an example, Mosaic is assessing changes in emission allowances that will be effective in 2026 that will have significant impact on one of our Saskatchewan potash mines. Current boilers (operating assets) will not meet emissions requirements and we are exploring options, including equipment alterations that would require capital investments, in order to meet compliance standards. A capital project team has been assembled to conduct detailed analyses to assess solutions and the potential cost implications, but based on preliminary estimates, the financial impact could be more than \$75 million. This impact on our operating assets is considered to be high magnitude.
Liabilities	Not impacted	At this time, our identified risks related to climate change have not had an impact on our company's liabilities. However, we are assessing the potential financial implications of federal and provincial carbon tax scenarios under consideration in Canada that could have an impact on our tax liabilities.
Other	Please select	

C3. Business Strategy

C3.1

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

Yes

C3.1a

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

Yes, qualitative

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

(C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b) Indicate whether your organization has developed a low-carbon transition plan to support the long-term business strategy.

No, we do not have a low-carbon transition plan

C3.1c

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

Mosaic's strategy and business objectives have been influenced by climate change in several ways. Climate related issues, specifically the Paris Agreement and related country-specific efforts to reduce greenhouse gas emissions, have influenced our engagement with stakeholders, including government and industry associations. Similarly, fertilizer production is an energy- and GHG-intensive activity. In anticipation of changing weather patterns, potential shortages of water, the possibility of increasing energy costs and possible carbon/energy taxes and their potential effects on our business, Mosaic employs a strategy that focuses on operational excellence and we have made strategic decisions about our operating activities in order to address operating efficiency and resource management. For example, we strive to lower purchased energy consumption through more efficient processes and maximizing use of cogenerated energy, which has a direct impact on our GHG emissions. Climate change considerations, and the focus on reducing energy and GHG emissions, have influenced our development and execution of our companywide 2020 Sustainability Targets to reduce energy and GHGs by 10% per tonne of finished product, progress toward which we report annually. As an example of a substantial business decision in 2018, in line with our strategic efforts to reduce energy and GHGs, we executed a project to convert a diesel booster pump station from diesel to electricity, which reduced fuel use and associated GHGs. We are currently contemplating new companywide GHG and energy targets and other projects that will reduce energy use and emissions.

C3.1d

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

Climate-related scenarios	Details
Nationally determined contributions (NDCs)	<p>We have facilities in Saskatchewan, Canada that will be affected by Canada’s intended NDC, which aims to achieve, by 2030, an economy-wide target of reducing GHG emissions by 30% below 2005 levels. In late 2016, the federal government announced plans for a comprehensive tax on carbon emissions, under which provinces opting out of the tax would have the option of adopting a cap-and-trade system. In the plans, the federal government also committed to implementing a federal carbon pricing backstop system that will apply in any province or territory that does not have a carbon pricing system in place by 2018. As of January 1, 2019, a carbon tax of \$20/tonne now applies in Canada for any emitter not covered under the federal backstop program or approved provincial program. In addition, the Province of Saskatchewan, in which our Canadian potash mines are located, has publicly stated that a carbon pricing system will not be implemented in the province and that legal action will be sought against the federal government. In December 2017, Saskatchewan announced a comprehensive plan to address climate change that does not include an economy-wide price on carbon but does include a system of tariffs and credits for large emitters. The plan was reviewed and approved, in part, by the federal government in October 2018. Our Saskatchewan Potash facilities will be subject to the Saskatchewan climate change plan regarding emissions at our facilities; however, indirect costs from the carbon tax associated with energy consumption, and transportation are passed through to Mosaic. As implementation of the Paris Agreement proceeds, more stringent laws and regulations may be enacted to accomplish the goals set out in Canada’s NDC, such as the Clean Fuel Standard, which is now under development in Ottawa. We are currently assessing scenarios proposed by the provincial and federal governments, including potential financial repercussions and the potential future effect on our operating activities, energy, raw material and transportation costs, results of operations, liquidity or capital resources. The current regulatory environment in Saskatchewan for the potash industry includes a 5% intensity reduction with a compliance cost of \$20 CAD per tonne of CO₂e for businesses generating more than 25,000 tonnes CO₂e. The compliance increases annually until 2022 to \$50 CAD per tonne. Accordingly, 2022 is relevant to Mosaic and the time horizon we are considering in this example. Under this scenario, the financial repercussions for Mosaic, specifically our Potash Segment, could be significant to us. The results of our analyses, which were informed with inputs such as historic and projected facility-specific production figures and energy and emissions performance, have informed our CAPEX strategy as we plan for potential costs and continue to analyze options for reducing emissions in line with the NDC. Specifically, we have project trackers for each of our potash facilities that capture potential projects and associated costs, GHG and energy savings, and returns on investments.</p>

C4. Targets and performance

C4.1

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

Intensity target

C4.1b

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

Target reference number

Int 1

Scope

Scope 1+2 (location-based)

% emissions in Scope

100

Targeted % reduction from base year

10

Metric

Metric tons CO₂e per metric ton of product

Base year

2012

Start year

2015

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

0.27

Target year

2020

Is this a science-based target?

No, but we anticipate setting one in the next 2 years

% of target achieved

100

Target status

Underway

Please explain

In 2015 we announced a target to reduce our combined Scope 1 and Scope 2 GHG emissions by 10% per tonne of finished product by 2020. In 2018 we achieved a 13.9% reduction in Scope 1 and 2 emissions from our 2012 baseline thanks to efforts of our employees to create fuel- and energy-saving projects across the business. Current GHG reduction targets are based on internal operational performance and cover Scope 1 and 2 emissions from operations in North and South America, excluding facilities acquired in our Mosaic Fertilizantes business in early 2018. Our GHG target, although not recognized by the Science Based Targets Initiative for being in line with their particular methodology, was developed with science-based models that take company and industry-specific factors into account. Our GHG target does not include Scope 3 emissions at this time. However, we made progress toward defining a more comprehensive Scope 3 emissions footprint in 2015 by engaging a third-party consultant to help us assess the relevance of Scope 3 emissions categories and calculate their respective GHG impacts. We report those emissions in Section 6. We are currently refreshing targets that will incorporate our newly acquired facilities in Brazil and considering the feasibility of science-based targets as part of this work.

% change anticipated in absolute Scope 1+2 emissions

7.6

% change anticipated in absolute Scope 3 emissions

0

C4.2

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

Target

Energy usage

KPI – Metric numerator

Energy Consumption

KPI – Metric denominator (intensity targets only)

Metric tonne of product

Base year

2012

Start year

2015

Target year

2020

KPI in baseline year

2.73

KPI in target year

2.46

% achieved in reporting year

100

Target Status

Achieved

Please explain

In 2018 we achieved a 12.1% reduction in energy intensity from our 2012 baseline. This reduction was due to efficiency efforts and reductions in energy use in our Potash operations.

Part of emissions target

This target, though considered separate from our emissions target, is directly linked to emissions because reductions in direct and indirect energy help drive emissions reductions. Both the energy and GHG emissions targets are part of Mosaic's 2020 Sustainability Targets.

Is this target part of an overarching initiative?

No, it's not part of an overarching initiative

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	21	
To be implemented*	8	100000
Implementation commenced*	3	50000
Implemented*	12	107914
Not to be implemented	6	

C4.3b

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

Initiative type

Energy efficiency: Processes

Description of initiative

Fuel switch

Estimated annual CO2e savings (metric tonnes CO2e)

108

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

28000

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

0

Payback period

<1 year

Estimated lifetime of the initiative

6-10 years

Comment

One of Mosaic's potash facilities replaced diesel ram cars with battery ram cars, thereby reducing GHGs and diesel use by 10,000 gallons per year.

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

133

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

8000

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

0

Payback period

<1 year

Estimated lifetime of the initiative

>30 years

Comment

A potash facility saved natural gas by reducing the temperature of a stack used in the drying process.

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

265

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

16500

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

0

Payback period

<1 year

Estimated lifetime of the initiative

>30 years

Comment

By retiring a boiler, a potash facility reduced natural gas use.

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

208

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

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

106000

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

0

Payback period

<1 year

Estimated lifetime of the initiative

>30 years

Comment

A Mosaic potash facility saved purchased electricity by distributing electricity demand more efficiently.

Initiative type

Energy efficiency: Processes

Description of initiative

Fuel switch

Estimated annual CO2e savings (metric tonnes CO2e)

8640

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

900000

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

800000

Payback period

<1 year

Estimated lifetime of the initiative

>30 years

Comment

One of Mosaic's potash facilities converted a booster pump station from diesel to more efficient electricity, thereby saving fuel and associated GHG emissions.

Initiative type

Energy efficiency: Building services

Description of initiative

Lighting

Estimated annual CO2e savings (metric tonnes CO2e)

10682

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

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

600000

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

2000000

Payback period

4 - 10 years

Estimated lifetime of the initiative

6-10 years

Comment

Companywide, we converted lighting to more efficient LED lights, which saves purchased electricity and GHG emissions.

Initiative type

Process emissions reductions

Description of initiative

Behavioral change

Estimated annual CO2e savings (metric tonnes CO2e)

17000

Scope

Scope 3

Voluntary/Mandatory

Voluntary

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

0

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

0

Payback period

No payback

Estimated lifetime of the initiative

>30 years

Comment

Mosaic's Phosphate Business implemented an alternative work schedule that reduced employee the number of days employees commute, thereby reducing fuel consumption and associated GHGs.

Initiative type

Energy efficiency: Processes

Description of initiative

Machine replacement

Estimated annual CO2e savings (metric tonnes CO2e)

6480

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

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

45000

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

100000

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

A Brazil phosphate facility replaced pumps with more efficient versions, which resulted in electricity savings.

Initiative type

Process emissions reductions

Description of initiative

Behavioral change

Estimated annual CO2e savings (metric tonnes CO2e)

3600

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

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

78000

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

104000

Payback period

1-3 years

Estimated lifetime of the initiative

>30 years

Comment

A Brazil phosphate facility reconfigured the production process to shut down a conveyor belt during off-operation periods, which resulted in electricity savings.

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

18622

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

3500000

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

65000

Payback period

<1 year

Estimated lifetime of the initiative

>30 years

Comment

Several process improvements at a phosphate fertilizer production plant in Brazil resulted in improved efficiency and reductions in fuel use and associated fuel and GHG savings.

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

21596

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

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

650000

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

0

Payback period

<1 year

Estimated lifetime of the initiative

>30 years

Comment

As part of their broader business transformation efforts to improve efficiency, reduce costs and increase production, our phosphate minerals facilities implemented process efficiencies that reduced energy use and associated GHGs.

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

20580

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

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

169000

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

0

Payback period

<1 year

Estimated lifetime of the initiative

>30 years

Comment

A phosphate minerals facility implemented reliability improvements that resulted in their being able to use additional cogenerated (emissions-free) electricity instead of fossil fuel-based power from the grid, thereby reducing emissions.

C4.3c

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

Method	Comment
Employee engagement	Mosaic emphasizes the philosophy of continuous energy improvements to improve energy use in our manufacturing facilities and support functions and recognizes that employees on the front line often have the best ideas. Mosaic fosters a culture which encourages employees to come forward with ideas, and this open dialogue has driven investments that result in energy savings and/or emissions reductions. In 2018, we continued an internal communications effort around "small wins" as a way to recognize employees for their efforts, large and small, in improving environmental performance and meeting companywide 2020 Sustainability Targets.
Other	Mosaic facilities have employees that are designated engineers and/or sustainability site leads. The role of these site leads, in part, is to identify project opportunities for improving energy efficiency and GHG emissions that will help us achieve our 2020 target to reduce energy use and GHG emissions by 10% per tonne of product.
Compliance with regulatory requirements/standards	New or proposed regulatory emissions requirements may require modifications to our facilities or to operating procedures and these modifications may involve significant investments.

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

Product

Description of product/Group of products

Mosaic's premium product MicroEssentials® has been shown to increase corn yields an average of 7.2 bushels per acre, or 4.3%, compared to traditional fertilizer.

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

Avoided emissions

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

Other, please specify (See Comment)

Other: US EPA Climate Leaders: Direct HFC and PFC Emissions from Manufacturing Refrigeration and Air Conditioning Equipment The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition) US EPA Climate Leaders: Direct Emissions from Mobile Combustion Sources US EPA Mandatory Greenhouse Gas Reporting Rule: Subpart G (Ammonia) and Z (Phosphoric Acid) US EPA Climate Leaders: Indirect Emissions from Purchases/Sales of Electricity and Steam Stoichiometric mass balance for reactive species containing CO2 or carbon compounds Mass Balance from European Fertilizer Manufacturers Association Guidance for Ammonia Manufacturing University of Missouri Extension: Agricultural Fuel Requirement Estimates for Selected Field Operations GWP: IPCC Second Assessment Report (SAR - 100 year)

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

30

Comment

Mosaic's premium product MicroEssentials® has been shown to increase corn yields an average of 7.2 bushels per acre, or 4.3%, compared to traditional fertilizer. Assuming a 4.3% yield advantage with MicroEssentials®, a corn farmer with a 350 acre farm can theoretically produce yields similar to those from a 365.05 acre farm. By using MicroEssentials®, this farmer could avoid approximately 0.1816 tonnes of Scope 1 carbon emissions per year, through reduced corn harvesting equipment usage, resulting in greater yields with MicroEssentials® and fewer acres farmed. This theoretical example is fleshed out below to give an idea of annual scale of avoided emissions for 100 farms. The estimate takes into consideration the tonnes of CO2e/gallon generated by the diesel fuel needed for the operation of a corn harvester per acre. The potential yield of a 350 acre farm yielding 365.05 acres worth of crops was used as the baseline for this Scope 1 emissions savings. A 2.5 mph corn harvester (farming equipment) uses 1.15 gallons/acre of diesel fuel, which equates to 0.0120648 tonnesCO2e/gallon of diesel fuel. Assuming a 4.3% yield advantage with MicroEssentials®, a corn farmer with a 350 acre farm can theoretically produce yields similar to those from a 365.05 acre farm. This farmer could avoid approximately 0.1816 tonnes of Scope 1 carbon emissions per year by harvesting the same yield on a smaller area. For every 100 farms similar to this example equals a combined savings of 18.16 tonnes of Scope 1 carbon emissions per year. This is a theoretical example only. The percentage of total sales is for tonnes of MicroEssentials® as a share of total Phosphates sales tonnes. Sales for MicroEssentials® are not available as a separate line item expressed as revenue. Note for Methodology: US EPA Climate Leaders: Direct HFC and PFC Emissions from Manufacturing Refrigeration and Air Conditioning Equipment; GHG Protocol: A Corporate Accounting and Reporting Standard; US EPA Climate Leaders: Direct Emissions from Mobile Combustion Sources US EPA Mandatory Greenhouse Gas Reporting Rule: Subpart G (Ammonia) and Z (Phosph. Acid); US EPA Climate Leaders: Indirect Emissions from Purchases/Sales of Electricity and Steam Stoichiometric mass balance for reactive species containing CO2 or carbon compounds; Mass Balance from European Fertilizer Manufacturers Association Guidance for Ammonia

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 2012

Base year end

December 31 2012

Base year emissions (metric tons CO2e)

2904196

Comment

Scope 2 (location-based)

Base year start

January 1 2012

Base year end

December 31 2012

Base year emissions (metric tons CO2e)

1605383

Comment

Scope 2 (market-based)

Base year start

January 1 2012

Base year end

December 31 2012

Base year emissions (metric tons CO2e)

1605383

Comment

C5.2

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

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

US EPA Climate Leaders: Direct HFC and PFC Emissions from Manufacturing Refrigeration and Air Conditioning Equipment

US EPA Climate Leaders: Indirect Emissions from Purchases/ Sales of Electricity and Steam

US EPA Climate Leaders: Direct Emissions from Mobile Combustion Sources

US EPA Mandatory Greenhouse Gas Reporting Rule

Other, please specify (See 5.2a for details)

C5.2a

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

Other 1: by stoichiometric mass balance for reactive species containing CO₂ or carbon compounds to estimate emissions from materials used in water treatment

Other 2: mass balance from European Fertilizer Manufacturers Association Guidance for Ammonia Manufacturing to estimate emissions from ammonia production

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)

3753783

Start date

January 1 2018

End date

December 31 2018

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 are reporting a Scope 2, market-based figure

Comment

Market based emissions available for most locations in the United States, Brazil and Saskatchewan, representing 96% of our total Scope 2 emissions. We do not have market based emission factors available for sites in Peru or Paraguay facilities at this time.

C6.3

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

Reporting year

Scope 2, location-based

1686656

Scope 2, market-based (if applicable)

1549659

Start date

January 1 2018

End date

December 31 2018

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

China and India Facilities

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

Historically, Scope 1 and Scope 2 emissions from these facilities have accounted for less than 0.1 percent of global company emissions. CY2018 emissions were not calculated for our China and India facilities.

C6.5

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

Purchased goods and services

Evaluation status

Relevant, calculated

Metric tonnes CO2e

2856541

Emissions calculation methodology

Ammonia purchased based on IPCC 2013 guidance for NH3 production with modern, natural gas NH3 plants.

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

0

Explanation

Ammonia, an input material to our final products, accounts for a majority of the environmental impacts associated with purchased goods and services. Accordingly, emissions associated with ammonia are currently calculated. This value was included in our 2018 data assurance process for North America. This figure, which represents purchases for North America and South America, differs from our third-party assurance statement by approximately 10%.

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO2e

457437

Emissions calculation methodology

Calculated with third-party proprietary hybrid EEIO/LCA model in conjunction with company spend data to calculate absolute emissions from Mosaic's capital goods (e.g., equipment). Figure represents emissions associated with capital expenditures data from our 10K for 2018 from our North American operations. This value was not included in our 2018 data assurance process.

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

0

Explanation

2018 emissions from capital expenditures associated with operations were calculated using an average factor from a third-party analysis of 2014 data that was applied to 2018 capital expenditures figures. Some capital expenditures may have been inadvertently excluded. This value was not included in our 2018 data assurance process.

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

Evaluation status

Relevant, calculated

Metric tonnes CO2e

623555

Emissions calculation methodology

Calculated by using average DEFRA emission factors for upstream emissions per unit of consumption of the relevant fuel and energy types based on internally-collected fuel use data.

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

0

Explanation

Includes companywide fuels and electricity purchases. This value was not included in our 2018 data assurance process.

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO2e

1096556

Emissions calculation methodology

Calculations basis derived from GHG Protocol Technical Guidance for Calculating Scope 3 Emissions. Road Transport calculations consider empty backhauling. Road Transport calculations based on miles traveled, tons hauled, average fuel efficiency and considers empty back hauling. Maritime Transport based on tons shipped, fuel efficiency, mileage, transport time and other factors including ship efficiency rating from RightShip. This value was included in our 2018 data assurance process. Figure is notably higher than 2017 due to our inclusion of data from sites that were acquired in 2018.

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

5

Explanation

Includes movements by rail, truck, articulated barge and vessel in North American and some international transport. We have started gathering emissions data from an additional rail transportation provider in 2018. This value was included in our 2018 data assurance process.

Waste generated in operations

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

17806

Emissions calculation methodology

Calculated with average 2018 DEFRA factors by disposal method for construction debris. This value was included in our 2017 data assurance process. Figure is notably higher than 2017 due to our inclusion of data from sites that were acquired in 2018.

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

0

Explanation

Figure represents waste generated during our mining and fertilizer manufacturing activities. It does not include mining wastes.

Business travel

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

3294.14

Emissions calculation methodology

Business Travel includes air and rail travel and uses DEFRA 2017 emission factors.

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

100

Explanation

Includes all corporate travel for Mosaic employees by rail and air. This value was included in our 2018 data assurance process

Employee commuting

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

32000

Emissions calculation methodology

Figure represents approximate CO2e associated with the commutes of employees at our Florida operations, representing approximately 30% of the total workforce. It considers an average commute distance of 22 miles, gleaned through an employee survey, and assumes gasoline use for an average size car in the United States. This represents less than .5% of our total scope 3 emissions.

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

0

Explanation

Based on a third party evaluation to assess the greenhouse gas emissions across our value chain, employee commuting for our total workforce is estimated to represent less than 1% of total scope 3 emissions. This is logical and in line with expectations considering the emissions accounted for in purchased goods and services, fuel- and energy-related activities and use of sold products categories. The figure above represents the approximate CO2e associated with the commutes of employees at our Florida operations, representing approximately 30% of the total workforce.

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>

Explanation

Emissions associated with leased assets under Mosaic's operational control including land, pumps, autos, mobile equipment and railcars are accounted for in Scope 1 and 2 inventories. Emissions associated with other upstream leased assets (IT equipment, copiers, etc.) are estimated to represent less than 0.1% of total scope 3 emissions. This is logical and in line with expectations considering the emissions accounted for in purchased goods and services, fuel- and energy-related activities and use of sold products categories.

Downstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

297491

Emissions calculation methodology

Calculations basis derived from GHG Protocol Technical Guidance for Calculating Scope 3 Emissions (April 2013). Road Transport calculations consider empty backhauling. Road Transport calculations based on miles travel, tons hauled, average fuel efficiency and considers empty back hauling. Maritime Transport based on tons shipped, fuel efficiency, mileage, transport time and other factors including ship efficiency rating from RightShip.

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

38

Explanation

Includes movements by rail, truck, articulated barge and vessel in North American and some international transport. Does not include river barges in North America. Excludes transport of products when customers arrange for transportation. This value was included in our 2018 data assurance process.

Processing of sold products

Evaluation status

Not relevant, calculated

Metric tonnes CO₂e

3700

Emissions calculation methodology

Calculated based on average emissions intensity of processing products at Mosaic blending locations.

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

0

Explanation

Includes all tonnes of crop nutrients sold in North America and assumes that they are blended at the distributor level. This value was not included in our annual data assurance process.

Use of sold products

Evaluation status

Relevant, calculated

Metric tonnes CO2e

682129

Emissions calculation methodology

Limited calculation based on the amount of nitrogen per tonne of finished phosphate product sold in 2018 using 2006 IPCC Guidelines for National Greenhouse Gas Inventories related to fertilizer use.

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

0

Explanation

In 2015 we engaged third party to evaluate the environmental impacts associated with activities across our value chain. Emissions associated with use of sold products, as reported here, are based on results of a limited assessment based strictly on the amount of nitrogen per tonne of finished phosphate product sold in 2018. We continue to engage industry resources to provide a more holistic emissions figure for this relevant scope 3 category. This value was not included in our annual data assurance process.

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>

Explanation

Not applicable. Mosaic's principle products are crop nutrients, which are applied to the soil and then taken up by plants; the plants can be used for human or animal food.

Downstream leased assets

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

237000

Emissions calculation methodology

This figure represents emissions associated with downstream cattle leases on formerly mined land in the United States. The total was calculated using EPA figures for enteric fermentation. It assumes two mature beef cows per acre in the South Atlantic region of the U.S. and applies a factor of 69.80 kg CH₄ per cow. In 2018, Mosaic leased 68,000 acres for cattle. We consider this calculation simplified as it does not take into consideration the age and type (beef or dairy) characteristics of the cattle actually grazing on Mosaic-owned land.

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

0

Explanation

Most emissions from leased assets under Mosaic's operational control are included in Scope 1 and 2 inventories. The remainder are not material to total emissions footprint.

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>

Explanation

Not applicable to Mosaic operations. Mosaic does not operate franchises.

Investments

Evaluation status

Relevant, calculated

Metric tonnes CO2e

689694

Emissions calculation methodology

This figure represents emissions from fuel and energy consumption associated with Mosaic's stake in the Ma'aden Wa'ad Al Shamal Phosphate joint venture.

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

100

Explanation

This value represents emissions associated with Mosaic's stake in the Ma'aden Wa'ad Al Shamal Phosphate Company joint venture. This value was included in our annual data assurance process. Emissions associated with this category last year were part of our investment in the Miski Mayo joint venture. These figures are now part of Scopes 1 and 2 emissions inventories.

Other (upstream)

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>

Explanation

Not applicable to Mosaic operations. Upstream emissions accounted for above.

Other (downstream)

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>

Explanation

Not applicable to Mosaic operations. Downstream emissions accounted for above.

C6.7

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

No

C6.10

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

Intensity figure

0.0005657

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

5423613

Metric denominator

unit total revenue

Metric denominator: Unit total

9587300000

Scope 2 figure used

Location-based

% change from previous year

0.54

Direction of change

Increased

Reason for change

In 2018, we experienced increased ammonia production, as well as increase in CO2e due to acquisitions.

Intensity figure

429.12

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

5423613

Metric denominator

full time equivalent (FTE) employee

Metric denominator: Unit total

12639

Scope 2 figure used

Location-based

% change from previous year

15

Direction of change

Decreased

Reason for change

During 2018, a larger increase in the size of our workforce relative to an increase in our absolute emissions resulted in a year-over-year improvement in emissions per full-time employee.

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	3729113	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	18518	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	6152	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	1729426
Canada	891445
Brazil	951111
Paraguay	154
Peru	181647

C7.3

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

By business division

By facility

C7.3a

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

Business division	Scope 1 emissions (metric ton CO2e)
Phosphate	1869607
Potash	930857
Fertilizantes	951265
Distribution	2053

C7.3b

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

Facility	Scope 1 emissions (metric tons CO2e)	Latitude	Longitude
Faustina	847249	30.083384	-90.914391
New Wales	402943	27.832701	-82.051048
Bartow	144333	27.907545	-81.800537
Plant city	2831	28.168056	-82.141667
Uncle Sam	110679	30.037428	-90.827377
Riverview	125654	27.860191	-82.3936
Four Corners	24814	27.646202	-82.087097
Green Bay	0	27.820769	-81.784767
South Fort Meade	10334	27.647848	-81.756477
South Pierce	11587	27.765583	-81.940331
South Pasture	4330	27.585763	-81.94291
Wingate	2773	27.504131	-82.130203
Hookers Prairie	0	27.917828	-82.437286
Big Bend	434	27.80416	-82.397083
Taft	0	30.019122	-90.774707
Belle Plaine	686657	50.427658	-105.198296
Esterhazy K2	104672	50.65768	-101.848412
Colonsay	52014	51.934105	-105.763496
Esterhazy K1	44300	50.729282	-101.933723
Carlsbad	39412	32.412258	-103.939217
Esterhazy K3	3802	50.646084	-101.991946
Fospar	35438	-25.510841	-48.521633
Tampa Marine	120	27.926672	-82.43187
Houston	178	29.744053	-95.114723
Savage	178	44.779415	-93.336426
Henderson	1329	37.815159	-87.658173
Paranagua	216	-25.510841	-48.521633
Uberaba	50	-19.982393	-47.900391
Alto Arguaia	75	-17.151678	53.192689
Rio Verde	100	-17.807942	-51.008695
Candeias	62	-12.66295	-38.51944
Sorriso	195	-12.604993	-55.749907
Pekin	81	40.587875	-89.660637
Campo Grande	41	-21.258281	-48.492311
Paranagua II	403	-25.531969	-48.549938
Uberaba II	147	-19.788737	-47.943228
Villeta	154	-25.667817	-57.690011
Rondonopolis	268	-16.619864	-54.701082
Catalao	91	-18.190415	-47.970764
Hopewell	0	27.915899	-82.131219
Bonnie	0	27.863068	-81.932498
Hookers Point	58	27.917532	-82.439013
Port Sutton	109	27.905096	-82.410554
Rio Grande II	263	-32.102711	-52.113065
Cajati	331135	-24.714879	-48.124609
Uberaba III	198920	-19.993207	-47.883844
Araxa	67333	-19.629278	-46.977984
Catalao II	47269	-18.164763	-47.905652
Patrocinio	29504	-19.015003	-46.80879
Tapira	65181	-19.842885	-46.852427
Taquari Vassouras	1887	-10.651971	-37.03583
Patos de Minas	46	-18.374014	-46.913118
Miski Mayo	181647	-5.802229	-81.05289

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

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

	Gross Scope 1 emissions, metric tons CO2e	Net Scope 1 emissions , metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	1654710	<Not Applicable>	This emissions total represents the sum of all phosphates concentrates (chemical manufacturing) facilities.
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Electric utility generation activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

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 in market-based approach (MWh)
United States of America	734148	756322	1590945	58
Canada	842070	705896	1097817	73
Brazil	101419	78422	1059571	0
Paraguay	107	107	1185	0
Peru	8912	8912	99024	0

C7.6

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

By business division

By facility

C7.6a

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

Business division	Scope 2, location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Phosphate	685932	707747
Potash	889896	753722
Distribution	9302	9661
Fertilizantes	101526	78529

C7.6b**(C7.6b) Break down your total gross global Scope 2 emissions by business facility.**

Facility	Scope 2 location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Belle Plaine	30667	25708
Carlsbad	47826	47826
Big Bend	1117	1176
Bonnie	0	0
Bartow	35356	37222
Faustina	33218	23479
Green Bay	0	0
Colonsay	139735	117138
Mulberry	0	0
Nichols	0	0
New Wales	14669	15443
Plant City	7192	7571
Riverview	20640	21730
South Pierce	2975	3132
Taft	0	0
Uncle Sam	7014	4958
Henderson	1236	1236
Hookers Point	1033	1087
Houston	247	247
Pekin	396	396
Port Sutton	1063	1119
Savage	612	612
Tampa Marine	296	312
Esterhazy K1	209401	175538
Esterhazy K2	450654	377777
Esterhazy K3	11613	9735
Alto Arguaia	28	22
Candeias	33	26
Campo Grande	8	6
Catalao	209	162
Fospar	2807	2170
Paranagua	90	69
Paranagua II	118	91
Rondonopolis	104	80
Rio Verde	59	46
Sorriso	115	89
Uberaba	10	8
Uberaba II	16	12
Villeta	107	107
Four Corners	307196	323411
Fort Green	0	0

Facility	Scope 2 location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Hookers Prairie	0	0
Hopewell	0	0
Miski Mayo	8912	8912
Lonesome	0	0
South Fort Meade	114815	120875
South Pasture	56160	59124
Wingate	76668	80714
Streamsong	4419	4652
Rio Grande II	80	62
Cajati	8741	6759
Guara	32	25
Uberaba III	15815	12229
Araxa	16103	12452
Catalao II	13578	10499
Tapira	28730	22215
Taquari-Vassouras	14691	11360
Uberaba II	16	12
Patos de Minas	36	28

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

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

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	122181	114711	This emissions total represents the sum of all phosphates concentrates (chemical manufacturing) facilities.
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

C-CH7.8

(C-CH7.8) Disclose the percentage of your organization's Scope 3, Category 1 emissions by purchased chemical feedstock.

Purchased feedstock	Percentage of Scope 3, Category 1 tCO2e from purchased feedstock	Explain calculation methodology
Ammonia	100	At this time our reporting of Category 1 includes only ammonia purchase, which represents our most material category 1 emissions.

C-CH7.8a

(C-CH7.8a) Disclose sales of products that are greenhouse gases.

	Sales, metric tons	Comment
Carbon dioxide (CO2)	0	
Methane (CH4)	0	
Nitrous oxide (N2O)	0	
Hydrofluorocarbons (HFC)	0	
Perfluorocarbons (PFC)	0	
Sulphur hexafluoride (SF6)	0	
Nitrogen trifluoride (NF3)	0	

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?

Increased

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	0	No change	0	
Other emissions reduction activities	107914	Decreased	2.59	Our emissions savings projects for 2018 decreased our overall emissions by 2.59%. We arrived at this percentage by dividing the reduction from projects by 2017 total emissions, $(107,914 / 4,169,220) * 100 = 2.59\%$
Divestment	0	No change	0	
Acquisitions	1196562	Increased	29	We had a 29% increase in emissions due to acquisitions of facilities in Brazil and Peru. We arrived at this percentage by dividing our new facilities emissions by the 2017 total emissions, $(1196562 / 4,169,220) * 100 = 29\%$
Mergers	0	No change	0	
Change in output	126865	Increased	3.04	Due to a year-over-year increase in ammonia production, we experienced a 3.04% increase in tonnes of CO2e. We arrived at this percentage by dividing increase in ammonia production by 2017 total emissions, $(126,865 / 4,169,220) * 100 = 3.04$.
Change in methodology	0	No change	0	
Change in boundary	0	No change	0	
Change in physical operating conditions	0	No change	0	
Unidentified	38880	Increased	0.93	Due to 'unidentified' reasons, emissions were higher than the previous year by less than 1%. Last year, 38,880 tons of CO2e were increased via means we could not readily separate. Our total Scope 1 & Scope 2 emission in the previous year was 4,169,220. We arrived at 0.93% by $(38,880 / 4,169,220) * 100 = 0.93$. Increase in part due to the impacts of weather on operations and variability in production activities.
Other	0	No change	0	

C7.9b

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

Location-based

C8. Energy

C8.1

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

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

C8.2

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

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

C8.2a

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

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	0	10600059	10600059
Consumption of purchased or acquired electricity	<Not Applicable>	131	3848410	3848541
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>	131	14448469	14448600

C-CH8.2a

(C-CH8.2a) Report your organization's energy consumption totals (excluding feedstocks) for chemical production activities in MWh.

	Heating value	Total MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	2660128
Consumption of purchased or acquired electricity	<Not Applicable>	264718
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	0
Total energy consumption	<Not Applicable>	2924846

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)

Diesel

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

1290169

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Comment

Fuels (excluding feedstocks)

Natural Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

8111237

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

4538307

MWh fuel consumed for self-generation of steam

504256

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

3068674

Comment

Fuels (excluding feedstocks)

Propane Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

61786

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Comment

Fuels (excluding feedstocks)

Motor Gasoline

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

27750

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Comment

Fuels (excluding feedstocks)

Fuel Oil Number 1

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

1109117

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

1109117

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

Comment

C8.2d

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

Diesel

Emission factor

10.3

Unit

kg CO2e per gallon

Emission factor source

Pg. 29 The Climate Registry Default Emission Factors, revised May 2018

Comment

Number represents the summation of CO₂, N₂O and CH₄ emissions converted to CO₂e using base factors of 25 for CH₄ and 298 for N₂O as per IPCC Fourth Assessment Report (AR4).

Fuel Oil Number 1

Emission factor

11.3

Unit

kg CO₂ per gallon

Emission factor source

Pg. 29 The Climate Registry Default Emission Factors, revised May 2018

Comment

Number represents the summation of CO₂, N₂O and CH₄ emissions converted to CO₂e using base factors of 25 for CH₄ and 298 for N₂O as per IPCC Fourth Assessment Report (AR4).

Motor Gasoline

Emission factor

8.96

Unit

kg CO₂e per gallon

Emission factor source

Pg. 29 The Climate Registry Default Emission Factors, revised May 2018

Comment

Number represents the summation of CO₂, N₂O and CH₄ emissions converted to CO₂e using base factors of 25 for CH₄ and 298 for N₂O as per IPCC Fourth Assessment Report (AR4).

Natural Gas

Emission factor

53.06

Unit

kg CO2e per gallon

Emission factor source

Pg. 2 The Climate Registry Default Emission Factors, revised May 2018

Comment

Number represents the summation of CO₂, N₂O and CH₄ emissions converted to CO₂e using base factors of 25 for CH₄ and 298 for N₂O as per IPCC Fourth Assessment Report (AR4).

Propane Gas

Emission factor

5.74

Unit

kg CO₂e per gallon

Emission factor source

Pg. 31 The Climate Registry Default Emission Factors, revised March 2018

Comment

Number represents the summation of CO₂, N₂O and CH₄ emissions converted to CO₂e using base factors of 25 for CH₄ and 298 for N₂O as per IPCC Fourth Assessment Report (AR4).

C8.2e

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

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	2096791	1884756	0	0
Heat	9220354	9220354	0	0
Steam	22057324	22057324	0	0
Cooling	0	0	0	0

C-CH8.2e

(C-CH8.2e) Provide details on electricity, heat, steam, and cooling your organization has generated and consumed for chemical production activities.

	Total gross generation (MWh) inside chemicals sector boundary	Generation that is consumed (MWh) inside chemicals sector boundary
Electricity	1565448	1089874
Heat	5647424	5647424
Steam	22057324	22057324
Cooling	0	0

C8.2f

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

Basis for applying a low-carbon emission factor

Power Purchase Agreement (PPA) with energy attribute certificates

Low-carbon technology type

Wind

Region of consumption of low-carbon electricity, heat, steam or cooling

North America

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

73

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

0

Comment

Mosaic's Colonsay facility has a green power purchase agreement with utility (SaskPower) to purchase low carbon electricity and it is accounted for here.

Basis for applying a low-carbon emission factor

Off-grid energy consumption from an on-site installation or through a direct line to an off-site generator owned by another company

Low-carbon technology type

Solar PV

Region of consumption of low-carbon electricity, heat, steam or cooling

North America

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

58

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

0

Comment

Solar power located on site in Carlsbad, NM. 58 MWh generated to offset the purchase of electricity.

C-CH8.3

(C-CH8.3) Disclose details on your organization's consumption of feedstocks for chemical production activities.

Feedstocks

Natural gas

Total consumption

263845

Total consumption unit

thousand cubic metres

Inherent carbon dioxide emission factor of feedstock, metric tons CO2 per consumption unit

1.86

Heating value of feedstock, MWh per consumption unit

10.7

Heating value

LHV

Comment

Calculated using 1 MMBtu equivalent to 27.3 m³ natural gas from U.S. Energy Information Administration. Density of natural gas estimated at .8 kg/m³

Feedstocks

Other, please specify (Molten Sulfur)

Total consumption

4267397

Total consumption unit

metric tons

Inherent carbon dioxide emission factor of feedstock, metric tons CO2 per consumption unit

0

Heating value of feedstock, MWh per consumption unit

3.96

Heating value

LHV

Comment

Emissions from feed stock take the form of SO₂ which is consumed in the process to create an intermediary for our process. The heating value was calculated using energy generation per ton of intermediary product converted to per ton feedstock input.

C-CH8.3a

(C-CH8.3a) State the percentage, by mass, of primary resource from which your chemical feedstocks derive.

	Percentage of total chemical feedstock (%)
Oil	0
Natural Gas	5.8
Coal	0
Biomass	0
Waste	0
Fossil fuel (where coal, gas, oil cannot be distinguished)	94.2
Unknown source or unable to disaggregate	0

C9. Additional metrics

C9.1

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

Description

Energy usage

Metric value

2.4

Metric numerator

Total Energy Consumption

Metric denominator (intensity metric only)

Metric tonnes finished product

% change from previous year

3.9

Direction of change

Increased

Please explain

Increase in energy usage due to acquisition and increase in ammonia production.

Description

Other, please specify (Cogenerated power)

Metric value

1884757

Metric numerator

MWh

Metric denominator (intensity metric only)**% change from previous year**

2

Direction of change

Increased

Please explain

Cogenerated power is generated by harnessing waste heat from the sulfuric acid manufacturing process. Emissions associated with original source of the heat, sulfuric acid production, are accounted for in scope 1 emissions. As there are no incremental emissions associated with the production of power from this process, we are including it as a low-carbon source.

C-CH9.3a

(C-CH9.3a) Provide details on your organization's chemical products.

Output product

Ammonia

Production (metric tons)

412731

Capacity (metric tons)

455000

Direct emissions intensity (metric tons CO₂e per metric ton of product)**Electricity intensity (MWh per metric ton of product)**

Steam intensity (MWh per metric ton of product)

Steam/ heat recovered (MWh per metric ton of product)

Comment

As ammonia is an input used in our finished crop nutrient products, we have not calculated the emissions intensity associated with this chemical specifically.

Output product

Other, please specify (Sulfuric Acid)

Production (metric tons)

14744303

Capacity (metric tons)

Direct emissions intensity (metric tons CO2e per metric ton of product)

Electricity intensity (MWh per metric ton of product)

Steam intensity (MWh per metric ton of product)

Steam/ heat recovered (MWh per metric ton of product)

1.37

Comment

As sulfuric acid is an intermediate input used in our finished crop nutrient products, we have not calculated the emissions intensity associated with this chemical specifically. Rather, it is included in the facility, business unit and company-wide emissions figures.

Output product

Other, please specify (Phosphoric Acid)

Production (metric tons)

4932820

Capacity (metric tons)

5300000

Direct emissions intensity (metric tons CO2e per metric ton of product)

Electricity intensity (MWh per metric ton of product)

Steam intensity (MWh per metric ton of product)

Steam/ heat recovered (MWh per metric ton of product)

Comment

As phosphoric acid is an intermediate input used in our finished crop nutrient products, we have not calculated the emissions intensity associated with this chemical specifically. Rather, it is included in the facility, business unit and company-wide emissions figures.

Output product

Other, please specify (Phosphate Crop and Animal Feed Productions)

Production (metric tons)

8400000

Capacity (metric tons)

11700000

Direct emissions intensity (metric tons CO2e per metric ton of product)

0.223

Electricity intensity (MWh per metric ton of product)

0.19

Steam intensity (MWh per metric ton of product)

1.83

Steam/ heat recovered (MWh per metric ton of product)

0

Comment

Per CDP methodology, direct emissions intensity represents the Scope 1 emissions per unit production of operations related to phosphate crop and animal feed products. Also per CDP methodology, electricity intensity represents the electrical power consumed, both purchased and electricity that is generated within the facility, per unit production of operations related to phosphate crop and animal feed products.

Output product

Other, please specify (Potash Crop Nutrient)

Production (metric tons)

9270598

Capacity (metric tons)

10500000

Direct emissions intensity (metric tons CO2e per metric ton of product)

0.1

Electricity intensity (MWh per metric ton of product)

0.13

Steam intensity (MWh per metric ton of product)

Steam/ heat recovered (MWh per metric ton of product)

Comment

Per CDP methodology, direct emissions intensity represents the Scope 1 emissions per unit production of operations related to potash crop nutrients. Also per CDP methodology, electricity intensity represents the electrical power consumed, both purchased and electricity that is generated within the facility, per unit production of operations related to potash crop nutrients.

C-CH9.6

(C-CH9.6) Disclose your organization's low-carbon investments for chemical production activities.

Investment start date

March 1 2004

Investment end date

December 31 2018

Investment area

Property, plant and equipment

Technology area

Waste heat recovery

Investment maturity

Large scale commercial deployment

Investment figure

21000000

Low-carbon investment percentage

81 - 100%

Please explain

Mosaic has invested heavily in equipment that enables the internal generation of electricity in a process called cogeneration. The process of heat recovery allows several of our Phosphate plants and mines to significantly reduce the amount of third-party, primarily fossil-fuel based electricity required from utility companies. The cogeneration process begins at our manufacturing operations, where we use sulfuric acid to liberate crop nutrients (phosphorous) from raw material inputs. This process generates a significant amount of waste heat that is recovered and converted to steam by bottoming cycle combined heat and power systems. This steam is sent to turbine generators and converted to virtually greenhouse gas emissions-free electricity that powers our manufacturing facilities and mines. In instances when we generate more clean cogenerated energy than we can use at our own operations, the excess is exported to the local grid. We are constantly looking for opportunities to improve the efficiency and output of our cogeneration assets, including bringing additional turbo generators online to increase our low-GHG electrical generation capacity, when possible. Accordingly, there is no "end date" for this investment. The amount of investment depends on the specific project, but as an example of an investment figure, in 2016 we brought a turbo generator online at our Uncle Sam facility that can provide up to an additional 15 megawatts of low-GHG electrical generation capacity. This initiative cost approximately \$21 million. We are investigating technology upgrades that would allow us to harness additional waste heat to enable more production of cogenerated electricity at our Brazil phosphate facilities. These heat recovery systems would cost approximately \$25 million. The "start date" for this investment was assigned to March, 2004, as that was when The Mosaic Company was incorporated. However, Mosaic's legacy companies employed cogeneration technology prior to that date.

C10. Verification

C10.1

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

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

C10.1a

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

Scope

Scope 1

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Moderate assurance

Attach the statement

MOS Final Assurance of 2018.pdf

Page/ section reference

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Relevant standard

A1000AS

Proportion of reported emissions verified (%)

100

Scope

Scope 2 location-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Moderate assurance

Attach the statement

MOS Final Assurance of 2018.pdf

Page/ section reference

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Relevant standard

A1000AS

Proportion of reported emissions verified (%)

100

C10.1b

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope

Scope 3- at least one applicable category

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Attach the statement

MOS Final Assurance of 2018.pdf

Page/section reference

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Relevant standard

AA1000AS

C10.2

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

Yes

C10.2a

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

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C8. Energy	Other, please specify (Direct and indirect energy consumption)	AA1000AS	Energy information related to consumption and intensity verified by Trucost
C7. Emissions breakdown	Year on year change in emissions (Scope 1 and 2)	AA1000AS	Additional data assured in 2018 is year-on-year emissions change in Scope 2. See page 1 of attached Trucost Assurance Statement. MOS Final Assurance of 2018.pdf

C11. Carbon pricing

C11.1

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

No, but we anticipate being regulated in the next three years

C11.1d

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

In late 2016, the Canadian federal government announced plans for a comprehensive tax on carbon emissions, under which provinces opting out of the tax would have the option of adopting a cap-and-trade system. In the plans, the federal government also committed to implementing a federal carbon pricing backstop system that will apply in any province or territory that does not have a carbon pricing system in place by 2018. Our Saskatchewan Potash facilities will continue to work with the Saskatchewan Ministry of Environment, Environment and Climate Change Canada and other government stakeholders, through participation in industry associations, to determine next steps. We will also continue to monitor developments relating to the anticipated proposed legislation, as well as the potential future effect on our operating activities, energy, raw material and transportation costs, results of operations, liquidity or capital resources. In the meantime, the facilities continue to actively work toward 2020 sustainability targets to reduce energy use and GHGs per tonne of product. Other efficiency projects and large-scale projects and partnerships that have the potential to drive further reductions in GHG emissions are under consideration.

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

GHG Scope

Scope 1

Scope 2

Application

In anticipation of federal or provincial regulatory changes in Saskatchewan, Canada where we have potash mines, we have applied various pricing scenarios to our emissions performance in order to assess our potential exposure. For example, the Saskatchewan provincial regulatory system applies a compliance price of \$20 CAD per tonne of CO₂e for businesses whose GHG emissions are above a certain threshold. The compliance cost will increase to \$50 per tonne by 2022. We are considering this price for our Potash operations in Saskatchewan, Canada, using current/average GHG performance.

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

50

Variance of price(s) used

Using the example above, we have applied uniform pricing for our Potash operations in Saskatchewan, Canada, using current/average GHG performance.

Type of internal carbon price

Shadow price

Impact & implication

Applying the price of \$50 per tonne of CO₂e generated at our facilities in Canada, in line with the example above and assuming current/average GHG performance for each facility, the potential price implications to Mosaic, inclusive of indirect costs, could be more than \$10 million. Uniform pricing was used for each of our Saskatchewan sites and the analysis takes into consideration the tax increase from \$20 per tonne to \$50 per tonne by 2022. Canadian potash producers are already subject to higher tax rates and higher shipping costs than the world's other major potash producers. Implementation of a carbon tax in Canada would place an additional hardship on the Canadian potash producers, reducing their competitiveness and effectively suppressing the marketability of the world's most environmentally friendly potash; while adding to the advantages already enjoyed by the major overseas potash producers. Note: this impact represents an estimate only, and it a simplification of one scenario under consideration at the time of our completing this report. Our Saskatchewan Potash facilities will continue to work with the Environment and Climate Change Canada, the Saskatchewan Ministry of Environment and other government stakeholders, through participation in industry associations to determine next steps for this file. As part of that engagement, we are monitoring developments relating to the anticipated proposed federal legislation on national carbon pricing, as well as the potential future effect on our operating activities, energy, raw material and transportation costs, results of operations, liquidity or capital resources.

C12. Engagement

C12.1

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

Yes, our suppliers

Yes, our customers

Yes, other partners in the value chain

C12.1a

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

Type of engagement

Innovation & collaboration (changing markets)

Details of engagement

Run a campaign to encourage innovation to reduce climate impacts on products and services

% of suppliers by number

1

% total procurement spend (direct and indirect)

10

% Scope 3 emissions as reported in C6.5

38

Rationale for the coverage of your engagement

Ammonia accounts for a majority of the environmental impacts associated with Mosaic's purchased goods and services. We are engaging the industry to secure purchased ammonia from sources that are closer to our operations, which will save GHGs associated with the transportation of ammonia. Further, the manufacturers closer to our operations in the United States are generally more modern and employ advanced manufacturing technologies – which improves the plants' efficiency and energy use, thus resulting in fewer GHGs associated with manufacturing ammonia and emissions associated with Mosaic's purchased goods and services. Mosaic is enabling these GHG reductions through our engagement with these suppliers by signaling market demand for the more efficient ammonia.

Impact of engagement, including measures of success

Success will be measured as the number of ammonia tonnes purchased from suppliers closer to our U.S. operations. As of this date, we cannot quantify the impact of our engagement but expect that agreements for purchase of more efficient supply will materialize in 2020. Modern plants are approximately 20% more efficient than a mix of modern and older plants, per IPCC guidance; therefore, emissions associated with Mosaic's purchased goods and services stand to be potentially reduced by more than 500,000 tonnes CO₂e.

Comment

Type of engagement

Innovation & collaboration (changing markets)

Details of engagement

Run a campaign to encourage innovation to reduce climate impacts on products and services

% of suppliers by number

1

% total procurement spend (direct and indirect)

1

% Scope 3 emissions as reported in C6.5

10

Rationale for the coverage of your engagement

Our efforts to lower our emissions footprint extend into our supply chain, and we've made investments that have resulted in significant improvements. For example, we contract a fleet of more than 50 trucks that run on clean-burning compressed natural gas (CNG), and a second Mosaic trucking partner added four CNG trailers to their fleet in 2015. Success is measured, in part, by year-over-year increase in shipping volumes transported more efficiently, and year-over-year reduction in transportation-associated emissions. We continue to explore opportunities with suppliers to convert additional shipping volumes to CNG.

Impact of engagement, including measures of success

In 2018 we moved a total of approximately 800,000 tonnes of product with CNG, contributing to fewer (>1%) year-over-year transportation-associated GHG emissions.

Comment

Percent of total procurement spend figure represents approximate spend for North America including procurement expenditures, raw materials and shipping (supply chain) costs.

C12.1b

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

Type of engagement

Education/information sharing

Details of engagement

Run an engagement campaign to educate customers about the climate change impacts of (using) your products, goods, and/or services

% of customers by number

80

% Scope 3 emissions as reported in C6.5

10

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

Mosaic is committed to supporting best agricultural practices, including research and practices to minimize the environmental impact, including GHG emissions, associated with the use of our crop nutrient products. Mosaic supports the minimization of greenhouse gas emissions from the activities related to global food supply by encouraging stakeholders in the value chain, including direct retailer customers who interact directly with the end users of our products, to enhance their understanding, adoption and promotion of 4R Nutrient Stewardship. By applying the right fertilizer at the right rate, right time and in the right place, farmers minimize environmental impacts associated with fertilizer use, including potential greenhouse gas emissions. We select this group of customers due to their farming practices in key watersheds.

Impact of engagement, including measures of success

We measure success of this engagement in a variety of ways, including the number of acres under the guidance of nutrient service providers that have earned 4R Nutrient Stewardship Certification through the Nutrient Stewardship Council's 4R Nutrient Stewardship Certification Program. As of 2018, more than 50 nutrient service providers servicing 7,000 farmers are certified. These 50 nutrient service providers, more than 80% of whom are Mosaic's direct customers, cover 3.1 million farming acres.

C12.1c

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

We also engage direct users of our crop nutrition products. Mosaic is committed to supporting best agricultural practices, including research and practices to minimize the environmental impact, including GHG emissions, associated with the use of our crop nutrient products. Mosaic supports the minimization of greenhouse gas emissions from the activities related to global food supply by encouraging stakeholders in the value chain, including direct retailer customers who interact directly with the end users of our products, to enhance their understanding, adoption and promotion of 4R Nutrient Stewardship. By applying the right fertilizer at the right rate, right time and in the right place, farmers minimize environmental impacts associated with fertilizer use, including potential greenhouse gas emissions. We select this group of customers due to their farming practices in key watersheds.

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
Clean energy generation	Support with minor exceptions	As one of the world's leading crop nutrient companies, Mosaic has a responsibility to be actively engaged in the promotion of sound and sustainable public policies. We are proactive in educating government officials and staff at all levels of our company's operations, the key issues our company faces, our company's importance to local communities and the critical role we play in the world's food supply.	It is Mosaic's belief that the production of electrical energy from highly efficient waste heat recovery resources should be recognized and supported at the highest tier of cost effective clean energy resources. Mosaic could have additional opportunities for harnessing emissions-free power under a more supportive regulatory construct. We advocate for a balanced clean energy policy that encourages the generation, transmission, and consumption of existing, low-cost resources, such as waste heat recovery, protects the rights of waste heat generation under the provisions of the Public Utility Regulatory Policies Act of 1978, and promotes fairer pricing for third-party clean energy producers when selling power back to the electrical grid.
Carbon tax	Oppose	In 2016 the Canadian federal government announced plans for a comprehensive tax on carbon emissions, under which provinces opting out of the tax would have the option of adopting a cap-and-trade system. In addition, the Province of Saskatchewan, in which our Canadian potash mines are located, has stated that a carbon pricing system will not be implemented in the province and that legal action will be sought against the federal government, if necessary. In December 2017, Saskatchewan announced a comprehensive plan to address climate change that does not include an economy-wide price on carbon but does include a system of tariffs and credits for large emitters. The plan was subject to federal review and approved by the federal government. Our Saskatchewan Potash facilities will continue to work with the Saskatchewan Ministry of Environment and Environment and Climate Change Canada, through participation in industry associations, to determine next steps. We will also continue to monitor developments relating to the anticipated proposed legislation, as well as the potential future effect on our operating activities, energy, raw material and transportation costs, results of operations, liquidity or capital resources.	Production of potash in Canada results in significantly lower CO2e emissions per ton of product than the potash produced by the major overseas producers. Canadian potash producers are already subject to higher tax rates and higher shipping costs than the world's other major potash producers. Implementation of a carbon tax in Canada would place an additional hardship on the Canadian potash producers, reducing their competitiveness and effectively suppressing the marketability of the world's most environmentally friendly potash; while adding to the advantages already enjoyed by the major overseas potash producers. Implementation of the proposed carbon tax would likely cause Canadian potash producers to lose market share due to inevitable operating cost increases. Overseas potash producers would be the beneficiaries of the Canadian carbon tax, resulting in increased carbon emission intensity from the global potash industry as a whole.

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

Fertilizer Canada

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Per Fertilizer Canada's website, "The fertilizer industry takes seriously its responsibility as stewards of our soil, air and water resource. Sustainability can be achieved by balancing economic, social and environmental goals. Fertilizer Canada's members have been proactive in reducing their greenhouse gas emissions. Technological investments and process improvements have resulted in a significant reduction in emissions levels since the early 1990s. Further reductions are possible on the farm where fertilizer products are applied."

How have you influenced, or are you attempting to influence their position?

Mosaic is a member and Mosaic's Vice President of Public Affairs for the Potash segment serves on the Board of Directors for Fertilizer Canada (previously Canadian Fertilizer Institute).

Trade association

The Fertilizer Institute (TFI)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Per the TFI website, "TFI is the leading voice in the U.S. fertilizer industry, representing the public policy, communication and statistical needs of producers, manufacturers, retailers and transporters of fertilizer. Issues of interest to TFI members include security, international trade, energy, transportation, the environment, worker health and safety, and farm bill and conservation programs to promote the use of enhanced efficiency fertilizer."

How have you influenced, or are you attempting to influence their position?

Mosaic is a member of TFI and Joc O'Rourke, President and Chief Executive Officer of The Mosaic Company, serves on TFI's Board of Directors. Programs of TFI are funded by member companies that are dedicated to advocating for the fertilizer industry.

Trade association

Saskatchewan Mining Association (SMA)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

The SMA advocates for and protects the sustainability of the mining industry in the Province of Saskatchewan. Competitiveness of Saskatchewan mining companies continues to be a significant challenge due to lower rates of international taxation and less stringent regulatory requirements in other jurisdictions. The SMA believes strongly in a robust and protective regulatory regime, but this regime must be practical and cost-effective if industry is to survive/thrive in Saskatchewan and Canada. Implementation of a carbon tax in Canada will place an additional hardship on mining companies, reducing their competitiveness in the world market.

How have you influenced, or are you attempting to influence their position?

Mosaic currently has three members on the SMA Board of Directors and is active in efforts to provide solution-based technical assistance to Environment and Climate Change Canada and the Saskatchewan Ministry of Environment.

Trade association

Saskatchewan Potash Producers Association (SPPA)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

The SPPA advocates for and protects the sustainability of potash producers in the Province of Saskatchewan. Canadian potash producers create fewer emissions than their competitors and are subject to higher tax rates and higher shipping costs than the world's other major potash producers. Implementation of a carbon tax in Canada would place an additional hardship on the Canadian potash producers, reducing their competitiveness and effectively suppressing the marketability of the world's most environmentally friendly potash; while adding to the advantages already enjoyed by the major overseas potash producers.

How have you influenced, or are you attempting to influence their position?

Mosaic's Vice President of Human Resources of Potash and Senior VP of Potash serve on SPPA's Board of Directors, contributing to SPPA's efforts to preserve global competitiveness of Potash industry in Saskatchewan.

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?

Mosaic strives to be the global leader in the crop nutrient industry. We recognize the importance of being active in industry associations and cross-sector business forums that provide common platforms to advance cutting-edge scientific research and best management practices within our company and our industry. In addition to having a publicly available Leadership on Climate Change document that states our position on climate change, Mosaic has a process in place to carefully consider, on a case-by-case basis, the relevance of the engagement opportunities and alignment with our values and business strategies and pursues mutually beneficial partnerships. For example, we participate in key cross-sector and industry partnerships through membership and Board and/or committee involvement, which allows us to influence the work done by respective organizations in a way that is consistent with our strategy. Mosaic takes part in industry efforts to address the challenges of climate change and commits to further engage with policy makers and stakeholders on the issue of climate change. Mosaic recognizes that our action on climate change is good for the environment and for the long term financial health and viability of our company. Agronomy, EHS, and Public Affairs professionals interact with policymakers and global thought leaders to encourage the transfer of knowledge and to incorporate the latest thinking on sustainability into the Mosaic risk management process.

C12.4

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

Publication

In mainstream reports

Status

Complete

Attach the document

2018 10-K.pdf

Page/Section reference

PDF pg. 41-42, 93

Content elements

Risks & opportunities

Comment

Publication

In voluntary communications

Status

Complete

Attach the document

Performance Highlights - Mosaic.pdf

Page/Section reference

PDF pgs. 1-10

Content elements

Strategy
Emissions figures
Emission targets

Comment

Publication

In voluntary communications

Status

Complete

Attach the document

Mosaic-2018-Sustainability-Disclosure-and-GRI-Index-1.pdf

Page/Section reference

PDF pgs. 44-46

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures

Comment

C14. Signoff

C-FI

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

C14.1

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

	Job title	Corresponding job category
Row 1	James "Joc" C. O'Rourke	Chief Executive Officer (CEO)

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

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

Please confirm below

I have read and accept the applicable Terms