Welcome to your CDP Climate Change Questionnaire 2019

C0. Introduction

C0.1

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

MEG is a thermal heavy oil company focused on sustainable in situ thermal heavy oil development and production in the southern Athabasca region of Alberta, Canada. MEG is actively developing enhanced oil recovery projects that utilize steam-assisted gravity drainage (SAGD) extraction methods to improve the economic recovery of oil as well as lower carbon emissions. MEG transports and sells Access Western Blend (AWB or blend) to refiners throughout North America and internationally. MEG owns a 100% working interest in over 900 square miles of oil sands leases. In the GLJ Petroleum Consultants Ltd. Report (GLJ Report), effective December 31, 2018 with a preparation date of January 11, 2019, GLJ Petroleum Consultants Ltd. (GLJ) estimated that the leases it had evaluated contained 2.8 billion barrels of proved plus probable bitumen reserves. For information regarding MEG’s estimated reserves contained in the GLJ Report, please refer to the Corporation’s most recently filed Annual Information Form (AIF), which is available on the Corporation’s website at www.megenergy.com and is also available on the SEDAR website at www.sedar.com.

Alberta energy companies follow some of the most stringent environmental regulations in the world. At MEG, our focus is not just to meet regulatory requirements – we look for opportunities to go beyond compliance and use our proven technology and our processes to protect air, water and land. MEG employees are proud to work in Alberta’s oil sands and are committed to developing projects in an environmentally responsible manner. We invest extensive time and effort into planning where and how projects are developed. This proactive approach, combined with our implementation of leading-edge technology and environmental programs, mitigate impacts and help to create positive outcomes for current and future generations.

MEG currently operates the Christina Lake Regional Project (CLR) which is located in northeastern Alberta approximately 20 km northeast of Conklin. Bitumen production for the year ended December 31, 2018 averaged 87,731 bbls/d. MEG places significant focus on optimizing steam generation to improve environmental outcomes. An important metric for this purpose is Steam-Oil Ratio (SOR), the quantity of steam used to produce a barrel of oil. SOR is a key measure of efficiency for SAGD projects, with a lower SOR indicating that steam is more efficiently utilized. By decreasing the amount of steam used, MEG is able to reduce its per barrel water and fuel requirements which results in lower greenhouse gas emissions intensity and more economic projects. When about one-third of the resource from a well-pattern has been recovered using SAGD and the reservoir has been heated and pressurized, MEG’s patented proprietary enhanced modified steam and gas push (eMSAGP) technology can be introduced. eMSAGP involves the injection of a non-condensable gas, like natural gas, into the
reservoir to replace a significant portion of the steam. Over the past five years MEG has employed eMSAGP technology to develop our Phase 1, 2 and 2B assets. The application of eMSAGP and cogeneration have enabled MEG to lower greenhouse gas intensity below the in-situ industry energy average calculated based on reported data to Environment Canada, the Alberta Energy Regulator (AER) and the Alberta Electric System Operator (AESO).

In 2018, MEG’s business sustainability was enhanced through further improvements in the organization’s cost structure, as well as through measurable improvements in its environmental performance. MEG continued to achieve record low per barrel net operating costs and optimize water requirements with a substantial reduction in non-saline water demand by executing a reconfiguration to utilize produced water for backwash instead of non-saline water. A reduction in greenhouse gas ("GHG") intensity on a year-over-year basis was further realized through steam to oil ratio (SOR) efficiencies achieved with the continued application of eMSAGP and expansion of the enhanced Modified Vapor Extraction (eMVAPEX) pilot. In 2018, MEG had an average SOR of 2.19 which is approximately 20% lower than the SAGD industry volume weighted average SOR of 2.8 and significantly better than the SAGD project average of 3.9 (Peters & Co. – 2018 Year in Review).

C0.2

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

<table>
<thead>
<tr>
<th>Start date</th>
<th>End date</th>
<th>Indicate if you are providing emissions data for past reporting years</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 1, 2018</td>
<td>December 31, 2018</td>
<td>No</td>
</tr>
</tbody>
</table>

C0.3

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

Canada

C0.4

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

CAD

C0.5

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

Operational control
C-OG0.7

(C-OG0.7) Which part of the oil and gas value chain and other areas does your organization operate in?

Row 1

<table>
<thead>
<tr>
<th>Oil and gas value chain</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstream</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other divisions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid electricity supply from gas</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Position of individual(s)</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board-level committee</td>
<td>The Board of Directors is responsible for the overall stewardship of the Corporation and for overseeing the conduct of the business and activities of management, who are responsible for the day-to-day conduct of the business. Under the Board of Directors Mandate, MEG’s Board of Directors is responsible for verifying that MEG sets high environmental standards, is in compliance with environmental laws and regulations, and has key programs and policies in place for the health and safety of its employees in the workplace. The Board reviews and approves corporate strategies to mitigate environment, health and safety risks including climate change. Direction and oversight regarding climate is provided at the board level to ensure climate risks are factored into strategic business decisions. In 2018, the organization established a Health, Safety, Environment &amp; Reserves Committee of the Board. Direction and oversite of climate related matters has been designated to this committee.</td>
</tr>
</tbody>
</table>
**C1.1b**

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

<table>
<thead>
<tr>
<th>Frequency with which climate-related issues are a scheduled agenda item</th>
<th>Governance mechanisms into which climate-related issues are integrated</th>
<th>Please explain</th>
</tr>
</thead>
</table>
| Scheduled – all meetings | Reviewing and guiding strategy  
Reviewing and guiding annual budgets  
Setting performance objectives  
Monitoring implementation and performance of objectives  
Overseeing major capital expenditures, acquisitions and divestitures  
Monitoring and overseeing progress against goals and targets for addressing climate-related issues | Direction and oversite of climate related matters has been designated to the HS&E and Reserves Committee of the Board. The mandate of the HS&E and Reserves Committee expressly sets out responsibility for all matters relating to Health, Safety and Environment, as follows:  
a. The Committee is responsible for:  
i. monitoring management systems and internal controls addressing key risks in the areas of health, safety and the environment, and review risk management efforts undertaken by management;  
ii. considering and reviewing efforts by the Corporation to develop and implement policies, practices and procedures to ensure compliance with legislation regulating health, safety and the environment, including against industry benchmarks;  
iii. reviewing the policies, practices and procedures of management designed to mitigate key health, safety and environment risks and appraising results achieved by the Corporation in respect thereof; and  
iv. reviewing management estimates of abandonment and reclamation liabilities and the remediation activities of the Corporation.  
b. In addition to the foregoing, the Committee shall undertake on behalf of the Board such other initiatives as may be necessary or desirable to assist the Board in discharging its responsibility to ensure that appropriate health, safety and environmental programs are in place and operating effectively.  

Reports on MEG’s environmental performance, including greenhouse gas emissions, are provided to the committee on a quarterly basis by the Vice President of Subsurface Operations, Environment &...
The Committee reviews and approves corporate strategies to mitigate environmental risks including climate change.

Examples of actions taken include review and approval of strategic investments in cogeneration and MEG’s proprietary eMSAGP and eMVAPEX technologies.

At the end of 2018 MEG added an inspection compliance target to its corporate environmental performance targets which already include spills and GHG intensity. The GHG intensity target was established to further MEG’s commitment to intensity reductions and will be reviewed at subsequent Board meetings.

C1.2

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

<table>
<thead>
<tr>
<th>Name of the position(s) and/or committee(s)</th>
<th>Responsibility</th>
<th>Frequency of reporting to the board on climate-related issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS&amp;E and Reserves Committee of the Board</td>
<td>Both assessing and managing climate-related risks and opportunities</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Safety, Health, Environment and Quality committee</td>
<td>Both assessing and managing climate-related risks and opportunities</td>
<td>More frequently than quarterly</td>
</tr>
</tbody>
</table>

C1.2a

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

The Corporate Environment, Health and Safety (EH&S) Committee is a committee of the Executive Management Committee. The Corporate EHS Committee is responsible for providing guidance and oversight with respect to EH&S programs and consists of senior-most representatives from the following business areas: Health and Safety, Environment and Regulatory, Operations, Projects, Drilling, Seismic, Site Services, Legal and Human Resources. Job duties of the senior-most representatives include:
• ensuring operations follow company health, safety and environmental protection policies,
• assessing environmental conditions to ensure compliance with local and federal regulatory agencies and organization safety standards
• Ensuring compliance with city/provincial/state and/or federal environmental agencies and for the protection of personnel, facilities and equipment

Its primary function is to assist MEG in carrying out its responsibilities by reviewing, reporting and making recommendations on MEG’s policies, management systems and programs with respect to environment, health and safety and exercising due diligence in ensuring such policies, systems and programs are implemented and functioning properly. The committee meets at least monthly where it reviews, reports and makes recommendations on policies, management systems and programs with respect to EH&S. The Vice President Subsurface Operations, Environment & Regulatory, Reservoir and Geosciences and the Vice President Operations, Health & Safety Operations co-chairs the Corporate EHS Committee. On a monthly basis, the Committee monitors the company GHG emissions performance with respect to regulatory requirements and peer performance. The committee also reviews fuel efficiency of equipment and electricity trends to further assist in trending GHG performance. The Committee also addresses regulatory changes, risks and opportunities with respect to climate change. A monthly report capturing regulatory changes, risks and opportunities is provided to the committee.

In 2018, the direction and oversite of climate related matters was designated to the HS&E and Reserves Committee of the Board. The committee is composed entirely of independent directors. The mandate of the HS&E and Reserves Committee expressly sets out responsibility for all matters relating to Health, Safety and Environment, as follows:

c. The Committee is responsible for:
   v. monitoring management systems and internal controls addressing key risks in the areas of health, safety and the environment, and review risk management efforts undertaken by management;
   vi. considering and reviewing efforts by the Corporation to develop and implement policies, practices and procedures to ensure compliance with legislation regulating health, safety and the environment, including against industry benchmarks;
   vii. reviewing the policies, practices and procedures of management designed to mitigate key health, safety and environment risks and appraising results achieved by the Corporation in respect thereof; and
   viii. reviewing management estimates of abandonment and reclamation liabilities and the remediation activities of the Corporation.

d. (c) In addition to the foregoing, the Committee shall undertake on behalf of the Board such other initiatives as may be necessary or desirable to assist the Board in discharging its responsibility to ensure that appropriate health, safety and environmental programs are in place and operating effectively.

(d) The Committee, through its Chair, may contact directly any employee in the Corporation as it deems necessary, and any employees may bring before the Committee any matter on a confidential basis involving the Committee's mandate.
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).

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Who is entitled to benefit from these incentives?
Chief Executive Officer (CEO)

Types of incentives
- Monetary reward

Activity incentivized
- Efficiency target

Comment
A portion of annual incentives are linked to Health, Safety, and Environment performance indicators. Energy efficiency and GHG reduction efforts decrease overall input costs and have the ability to significantly reduce future capital costs. MEG expanded the previous “Health & Safety” category of its corporate performance scorecard to create a new “Health, Safety & Environment” category. Two new environmental measures were added to the category: Net GHG Intensity (to measure emissions) and Reportable Spill Intensity Volume. MEG is committed to continuously improving our environmental, health and safety performance. This commitment is reinforced in our corporate Environmental Health and Safety (EHS) policy and employee evaluations. Employees are recognized for exceptional performance through internal articles published on MEG’s corporate intranet site. In 2018 the corporate GHG intensity target was met.

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Who is entitled to benefit from these incentives?
Chief Financial Officer (CFO)

Types of incentives
- Monetary reward

Activity incentivized
- Efficiency target

Comment
A portion of annual incentives are linked to Health, Safety, and Environment performance indicators. Energy efficiency and GHG reduction efforts decreases overall input costs and have the ability to significantly reduce future capital costs. MEG expanded the previous “Health & Safety” category of its corporate performance scorecard to create a new “Health, Safety & Environment” category. Two new environmental measures were added to the category: Net GHG Intensity (to measure emissions) and Reportable Spill Intensity Volume. MEG is committed to continuously improving our environmental, health and safety performance. This commitment is reinforced in our corporate Environmental Health and Safety (EHS) policy and employee evaluations. Employees are recognized for exceptional performance through internal articles published on MEG’s corporate intranet site. In 2018 the corporate GHG intensity target was met.

Who is entitled to benefit from these incentives?
All employees

Types of incentives
Monetary reward

Activity incentivized
Efficiency target

Comment
A portion of annual incentives are linked to Health, Safety, and Environment performance indicators. Energy efficiency and GHG reduction efforts decreases overall input costs and have the ability to significantly reduce future capital costs. MEG expanded the previous “Health & Safety” category of its corporate performance scorecard to create a new “Health, Safety & Environment” category. Two new environmental measures were added to the category: Net GHG Intensity (to measure emissions) and Reportable Spill Intensity Volume. MEG is committed to continuously improving our environmental, health and safety performance. This commitment is reinforced in our corporate Environmental Health and Safety (EHS) policy and employee evaluations. Employees are recognized for exceptional performance through internal articles published on MEG’s corporate intranet site. In 2018 the corporate GHG intensity target was met.
Comment
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C2. Risks and opportunities

C2.1

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

<table>
<thead>
<tr>
<th>From (years)</th>
<th>To (years)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term</td>
<td>1–5</td>
<td>In the context of climate, short term is viewed over the period aligned with review cycle of greenhouse gas regulations (2021 and 2023 reviews for CCIR).</td>
</tr>
<tr>
<td>Medium-term</td>
<td>5–10</td>
<td>Aligned with MEG operating projects approvals.</td>
</tr>
<tr>
<td>Long-term</td>
<td>10–30</td>
<td>Aligned with facility lifetime and federal greenhouse gas framework (2030 Targets).</td>
</tr>
</tbody>
</table>

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

Climate change risks are considered both at the provincial and federal level due to the potential for changes to regulatory requirements by both government levels. MEG also considers market access implications of climate change policy and carbon production in both the US and Europe. MEG’s Enterprise Risk Management process identifies risks that could potentially be most significant to the organization and its ability to achieve its strategic objectives. Risks identified in MEG’s assessments are evaluated based on impact severity and likelihood of occurrence within the current business and political environment. Risks are quantified and prioritized, and risk mitigation strategies are updated by management and reviewed by MEG’s Board of Directors and the HS&E and Reserves Committee of the Board. MEG continuously monitors both facility GHG performance/efficiency as well as any changes to regulatory requirements and regularly updates management and the Board of Directors and Committee.

C2.2b

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

MEG uses a value-driven Enterprise Risk Management (ERM) philosophy to create and protect value and to address uncertainty. ERM is integrated into existing processes within the corporation such as strategic planning, business planning, operating practices, marketing, compliance monitoring, operating performance measurement and facility design.

MEG’s ERM risk assessment process uses a bottom up identification of risks that could potentially be most significant to the organization and its ability to achieve its business/strategic objectives. Risks identified in MEG’s assessments are tracked in a Corporate Risk Register and evaluated based on impact severity and likelihood of occurrence, based on the current business and political environment. The risk mitigation strategies at the asset-level and company-level are reviewed and updated by management as necessary. Risks are quantified and prioritized through heat mapping, and risk mitigation strategies are reviewed by MEG’s Board of Directors.

Risks are categorized in one of two ways:
1) Business Risks: Those that have a potential long term impact on MEG’s business and financial performance such as operational efficiencies, market access and commodity prices.
2) Event Risks: Event risks are generally limited to specific one-time events, with immediate impact such as fires, accidents and legal liability.

GHG risks are generally assessed as business level risks; however opportunity identification tends to focus at the asset level. Continuous improvement is integral to MEG’s compliance and EHS management system. As such, climate change risks and opportunities are monitored continuously and reported monthly to MEG’s corporate Environmental Health and Safety Committee and quarterly to the Board of Directors/HS&E and Reserves Committee of the Board. Climate change risks, including changing GHG regulations or changes in compliance costs, are communicated to shareholders in MEG’s Annual Information Form and other continuous disclosure publicly available on SEDAR. MEG defines substantive financial impact as an impact resulting in material change in the potential value of the corporation. MEG assesses the potential impact of the discussed climate related risks, as moderate to serious, which implies a potential impact of 2-5% or 5-10% on the net asset value of the corporation.

**C2.2c**

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

<table>
<thead>
<tr>
<th>Relevance &amp; inclusion</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current regulation</td>
<td>Relevant, always included</td>
</tr>
<tr>
<td></td>
<td>In Alberta the Climate Change and Emissions Management Act provides framework for managing GHG emissions. MEG is required to meet the requirements of this act including accompanying requirements such as the Carbon Competitiveness Incentive Regulation (CCIR) which came into force January 1, 2018 replacing the Specified Gas Emitters Regulation (SGER). MEG tracks its GHG performance in regard to the current regulation and communicates monthly to the Corporate EHS Site Committee and quarterly to the Board of Directors. The United Conservative Party was elected to the GOA on April 16th, 2019 and has stated they will replace the CCIR with a new system in early 2020. MEG will continue to monitor the outcomes and implications for MEG.</td>
</tr>
<tr>
<td>Emerging regulation</td>
<td>Relevant, always included</td>
</tr>
<tr>
<td></td>
<td>Changes to the political landscape and regulatory regimes where MEG operates can result in new regulatory requirements. A continuous legislative overview is conducted that informs MEG of proposed changes. MEG actively consults with the Government of Alberta and the Alberta Energy Regulator as it develops policy. MEG is currently reviewing and preparing for the new AER methane requirements that come into effect January 1, 2020 under Directive 17 and Directive 60.</td>
</tr>
<tr>
<td>Category</td>
<td>Relevance</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Technology</td>
<td>Relevant, always included</td>
</tr>
<tr>
<td>Legal</td>
<td>Relevant, always included</td>
</tr>
<tr>
<td>Market</td>
<td>Relevant, always included</td>
</tr>
<tr>
<td>Reputation</td>
<td>Relevant, always included</td>
</tr>
<tr>
<td>Acute physical</td>
<td>Relevant, always included</td>
</tr>
</tbody>
</table>
Changes to seasonal weather patterns and the corresponding effects of spring thaw on accessibility to MEG’s properties are evaluated.

### Chronic

**Physical**

Relevant, always included

In 2018 MEG engaged a third party to update climate data to consider more recent data and modelling information available in relation to physical climate changes and to re-evaluate potential effects these changes could have on the CLRP and other MEG operations. The third party looked at current climate and projected climate change scenarios. Variations in temperature and precipitation were evaluated to determine if significant changes in runoff, wildfire, wind patterns, and lightning are predicted. Changes to seasonal weather patterns and the corresponding effects of spring thaw on accessibility to MEG’s properties are evaluated.

### Upstream

**Relevant, always included**

The Alberta Climate Leadership Act came into force on January 1, 2017 and established an Alberta carbon pricing regime in the form of a carbon levy on various types of fuel. The levy also applied to MEG suppliers and MEG could be impacted due to pricing changes in contracts as a result. The United Conservative Party was elected to the GOA on April 16th, 2019 and introduced Bill 1, An Act to Repeal the Carbon Tax on May 22, 2019. The carbon levy no longer applied to any type of fuel as of that time.

Under the Greenhouse Gas Pollution Pricing Act, the federal government has established a cost per tonne of carbon on fuel use (Federal Fuel Charge) and a regulatory regime that will apply in jurisdictions where an equivalency is not in place. Alberta is re-designing elements of the carbon regime in 2019 and it is anticipated that the Federal backstop will not apply but this is yet to be determined.

### Downstream

**Relevant, always included**

Potential increases in extreme weather events such as forest fires or storms may result in structural damage to downstream infrastructure, impacting the availability of pipeline capacity and other transportation
facilities for MEG’s products as well as refining capacity. MEG mitigates this risk by utilizing a network of pipelines, rail and storage facilities to transport its products. MEG utilizes a network of pipeline, rail and storage facilities to optimize market access for the transport and sale of Alberta Western Blend (AWB) to refiners throughout North America and internationally. MEG has contracted for 50,000 bbls/d (expanding to 100,000 bbls/d in mid-2020) of blend transportation capacity on the Flanagan South and Seaway pipeline systems, which provide pipeline access from Flanagan, Illinois through Cushing, Oklahoma to U.S. Gulf Coast (USGC) refineries. MEG has incremental storage terminals at the USGC which, in addition to adding operational flexibility, also allow for loading ships for export internationally. In addition, MEG is a shipper on the Trans Mountain Expansion Project which, when in service, will provide MEG with 20,000 bbls/d of blend committed tidewater access to Canada’s west coast. Also, effective January 1, 2019, MEG secured 30,000 bbls/d of blend unit train loading capacity at the Bruderheim Terminal for 3 years, with a 1-year extension option. The Corporation's marketing assets and flexibility are enhanced by exclusive use of the Stonefell Terminal. This combination of strategic marketing assets advances MEG’s strategy of having long-term, broadening and reliable market access to world oil prices for its production.

C2.2d

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

MEG uses a value-driven Enterprise Risk Management (ERM) philosophy to create and protect value and to address uncertainty. ERM is integrated into existing processes within the corporation such as strategic planning, business planning, operating practices, marketing, compliance monitoring, operating performance measurement and facility design.

Continuous improvement is integral to MEG’s compliance and EHS management system. As such, climate change risks and opportunities are monitored continuously and reported monthly to MEG’s corporate Environmental Health and Safety Committee and quarterly to the Board of Directors and the Board HS&E and Reserves Committee. Climate change risks, including changing GHG regulations or changes in compliance costs, are communicated to Shareholders in MEG’s Annual Information Form.

Risks identified in MEG’s ERM reviews are evaluated based on impact severity and likelihood of occurrence, based on the current business and political environment, and the mitigation strategies are reviewed and updated by management. Risks are quantified and prioritized through a heat mapping process. Risks and opportunities with the highest likelihood and with the largest financial impact to the company are prioritized. MEG utilizes a corporate risk matrix that ranks risks based on likelihood and severity. Potential climate change impacts that pose safety, environmental and/or economic risks are evaluated, and an appropriate action plan
developed to mitigate the risk. Material risks are communicated with all levels of MEG leadership. Wherever possible, NPV assessments are performed to quantify the business risks and facilitate prioritization.

MEG has established a cross functional team of experts to examine GHG operational performance and identify areas of opportunity for efficiency improvement. Recommendations from this group inform operational capital investments, operating strategy as well as overall corporate strategy development. Opportunities identified and assessed by this team include production technology enhancements, operational efficiency projects (including Capital projects), carbon capture and storage opportunities as well as value-added downstream technologies.

Transitional: MEG manages the potential cost impact associated with changes to GHG legislation by investing in reservoir enhancement technologies. MEG continued to advance reservoir recovery technologies in 2018 to support its growth. A significant portion of MEG’s 2018 capital program was allocated to the eMSAGP growth project at Christina Lake Phase 2B, the first in a series of high-return projects that will boost production while lowering the Corporation’s cash costs and environmental footprint. eMSAGP technology involves co-injecting a non-condensable gas into the reservoir with the steam. Once there is sufficient heat in the reservoir, the non-condensable gas helps maintain pressure, reduces the SOR and frees up steam to be redeployed into new SAGD well pairs, thereby improving capital efficiency and reducing emissions. MEG also successfully completed phase 2 of a pilot of its new eMVAPEX solvent recovery process. This proprietary technology, if proven successful through expanded pilot operations, will further enhance MEG’s growth potential by reducing capital requirements and operating costs, while minimizing environmental impacts to land, air and water. In 2018 the expanded eMVAPEX pilot commenced and propane recycling facilities became fully operational. MEG has been granted funding from Alberta Innovates, Natural Resources Canada, Emissions Reductions Alberta, and Sustainable Development Technology Canada for continued eMVAPEX work.

MEG’s growth strategy is more sustainable and continuous at lower capital costs intensities. With a focus on cost, operational and GHG efficiencies, future growth will utilize proprietary reservoir technologies which will enable increased production and decrease GHG emissions. Rather than building large scale projects, MEG growth strategy focuses on efficiency to increase production and allocates significant capital investment to eMSAGP continued eMVAPEX testing and expansion.

Physical: Impacts of seasonal weather patterns identified in the ERM process and mitigated through engineering design and operational procedures. In order to better understand and manage future potential physical risks. MEG engaged a third-party to conduct a review of climate data to consider more recent data and modelling information available in relation to physical climate changes and to re-evaluate potential effects these changes could have on the CLRP and other MEG operations. The third-party study looked at current climate and projected climate change scenarios. Variations in temperature and precipitation were evaluated to determine if significant changes in runoff, wildfire, wind patterns, and lightning are predicted.
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.

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Risk 1</th>
</tr>
</thead>
</table>

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

The United Conservative Party (UCP) was elected to the GOA on April 16th, 2019 and introduced Bill1, an Act to Repeal the Carbon Tax on May 22, 2019. The carbon levy no longer applied to any type of fuel as of that time.

Under the Greenhouse Gas Pollution Pricing Act, the federal government has established a cost per tonne of carbon on fuel use (Federal Fuel Charge) and a regulatory regime that will apply in jurisdictions where an equivalency is not in place. Alberta is re-designing elements of the carbon regime in 2019 and it is anticipated that the Federal backstop will not apply but this is yet to be determined.

Time horizon

Short-term

Likelihood

Virtually certain

Magnitude of impact

Low
Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

300,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Captures fuel use subject to the carbon levy. The United Conservative Party (UCP) was elected to the GOA on April 16th, 2019 and introduced Bill 1, An Act to Repeal the Carbon Tax on May 22, 2019. The carbon levy no longer applies to any type of fuel as of that time.

Management method

MEG manages impacts to climate regulations through operation of efficient cogeneration facilities and reservoir production enhancements reducing GHG intensity. Financial analysis of varying market conditions, including carbon price, helped MEG recognize the opportunity to increase energy efficiency and manage carbon risks by adopting cogeneration. In addition, MEG increased the application of its eMSAGP technology across more production wells. This has improved operational performance and reduced costs, including GHG compliance costs. MEG continues to advance the development eMVAPEX. MEG’s Enterprise Risk Management process identifies risks that could potentially be most significant to the organization and its ability to achieve its strategic objectives. Risks identified in MEG’s assessments are evaluated based on impact severity and likelihood of occurrence within the current business and political environment. Risks are quantified and prioritized, and risk mitigation strategies are updated by management and reviewed by MEG’s Board of Directors. MEG continuously monitors both facility GHG performance/efficiency as well as any changes to regulatory requirements to mitigate the risks of increased pricing of GHG emissions. MEG also reduces fuel usage by running SAGD drilling rigs off of cogen power rather than diesel.

Cost of management

303,000

Comment

The cost of management is the cost of management of the carbon levy for 2018.

Identifier

Risk 2
Where in the value chain does the risk driver occur?
Direct operations

Risk type
Transition risk

Primary climate-related risk driver
Policy and legal: Enhanced emissions-reporting obligations

Type of financial impact
Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company-specific description
The CCIR replaced the SGER for compliance years 2018 and thereafter. SGER was an intensity-based facility-specific benchmark. The CCIR remains an emissions intensity-based regime requiring large emitters to reduce their emissions intensity below a prescribed level, or otherwise achieve this through a true-up obligation whereby credits can be applied against such required level, together with or as an alternative to physical abatement, with penalties for failure to achieve compliance. However, the CCIR has fundamental differences with SGER as the facility specific baselines in SGER have been replaced in the CCIR with product specific benchmarks. Under the SGER, MEG was required to report annually. In addition to annual compliance reports, the CCIR requires an annual forecasting report due and quarterly interim compliance reports. The United Conservative Party (UCP) was elected to the GOA on April 16th, 2019 and stated they will replace the CCIR with a new system in early 2020. MEG will continue to monitor the outcomes and implications for MEG, but it is likely that the system will result in some cost associated with supporting administrative compliance of reporting.

Time horizon
Short-term

Likelihood
Virtually certain

Magnitude of impact
Low

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
1,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)
Explaination of financial impact figure
Failure to comply with GHG Acts and regulations may result in the imposition of fines and penalties. As per the Climate Change and Emissions Management Act, a person who is guilty of an offence liable to a fine of not more than $1,000,000 in the case of a corporation.

Management method
To manage the increase exporting requirements, MEG has developed and maintains a GHG Methodology Document to document the calculation methodology, data sources and reporting process. This ensures that reporting is reporting requirements are met efficiently, consistently and high quality data. Furthermore, MEG undergoes an annual third party verification process which reviews the data controls and calculations methodologies.

Cost of management
50,000

Comment
Costs associated with supporting administrative compliance of reporting within the CCIR.

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 capital costs (e.g., damage to facilities)

Company-specific description
Physical risks from climate change can include event driven or longer-term shifts in climate patterns. Principal factors which could affect MEG’s operating results could include severe weather patterns or catastrophic events such as fires, lightning, earthquakes, extreme cold weather, storms or explosions and seasonal weather patterns and the corresponding effects of the spring thaw on accessibility to MEG’s properties. There is a possibility that severe and seasonal weather patterns will change in the area where MEG operates causing damage to infrastructure or interruptions to production.

Time horizon
Long-term

**Likelihood**
About as likely as not

**Magnitude of impact**
Medium-low

**Are you able to provide a potential financial impact figure?**
Yes, a single figure estimate

**Potential financial impact figure (currency)**
200,000,000

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact figure**
Estimated costs of business interruptions and damage to facility associated with acute events based risk risk, unmitigated by insurance coverage.

**Management method**
Impacts of severe and seasonal weather patterns are identified in the ERM process and mitigated through engineering design and operational procedures. The design of our facilities ensures that storm water run-off facilities have sufficient capacity to manage potential increases in flows and storm events. MEG has extensive environmental monitoring programs for water and wetlands that will identify trends and support appropriate adaptation of operating practices and facilities.

MEG’s facilities are located in a geographical area that is not prone to significant weather events such as hurricanes or flooding. Lightning strikes occur in the summer months and engineering design to safeguard personnel and facilities along with operational procedures are in place to manage risk to an acceptable level. MEG has a trouble tree program in place to remove hazardous trees that could potentially struck infrastructure such as powerlines.

In 2018 MEG engaged a third-party review of physical climate changes and potential effects these changes could have on CLRP operations. Results will be used to ensure ongoing preparation and proper facility design for the range of climate conditions that may be expected.

**Cost of management**
50,000

**Comment**
Cost of review of physical climate changes and potential effects these changes could have on CLRP operations. Results will be used to ensure ongoing preparation and proper facility design for the range of climate conditions that may be expected.

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

**Company-specific description**
MEG’s operates within the boreal forest of Alberta. Forest fires are a natural part of the ecological cycle in the region and extreme periods of drought are likely to increase the risk of forest fire and therefore increasing risk to our operations.

**Time horizon**
Long-term

**Likelihood**
About as likely as not

**Magnitude of impact**
Medium-low

**Are you able to provide a potential financial impact figure?**
Yes, a single figure estimate

**Potential financial impact figure (currency)**
300,000,000

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact figure**
Estimated cost of business interruptions and damage to facility associated with acute events based risk, unmitigated by insurance coverage.
Management method
MEG’s facilities have been designed with fire breaks and setbacks consistent with Alberta FireSmart best practices. MEG employs fire prevention practices and has fire suppression systems, perimeter sprinkler systems and emergency response plans in place.

Impacts of seasonal weather patterns identified in the ERM process and mitigated through engineering design and operational procedures. In order to better understand and manage future potential physical risks. MEG has initiated a review of third party will update the climate data to consider more recent data and modelling information available in relation to physical climate changes and to re-evaluate potential effects these changes could have on the CLR and other MEG operations. The third party will look at current climate and projected climate change scenarios. Variations in temperature and precipitation will be evaluated to determine if significant changes in runoff, wildfire, wind patterns, and lightning are predicted.

Cost of management
50,000

Comment
MEG has implemented a site Fire Smart Program for near facility wildfire prevention and defense.

Identifier
Risk 5

Where in the value chain does the risk driver occur?
Direct operations

Risk type
Transition risk

Primary climate-related risk driver
Policy and legal: Mandates on and regulation of existing products and services

Type of financial impact
Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description
Emerging regulations: As part of Alberta’s Climate Change Leadership Plan, the AER is in the process of developing requirements to reduce methane emissions from upstream oil and gas operations by 45% by 2025. The requirements address the primary sources of methane emissions from Alberta’s upstream oil and gas industry: fugitive emissions and venting, which includes emissions from compressors, pneumatic devices and glycol dehydrators. Directive 17 and 60 have been released. Currently fugitive emissions monitoring requirements appear to be the requirement most significant to MEG and may
lead to additional costs associated with the increase in frequency and sources to be monitored.

**Time horizon**
- Short-term

**Likelihood**
- Virtually certain

**Magnitude of impact**
- Low

**Are you able to provide a potential financial impact figure?**
- Yes, a single figure estimate

**Potential financial impact figure (currency)**
- 100,000

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact figure**
Calculated as the potential annual cost for the Fugitive Emissions Program.

**Management method**
- MEG’s CLRIP facility has been designed to be a gas conserving facility, meaning venting does not occur in normal operating conditions. All MEG pneumatics run on instrument air and currently MEG does not operate glycol dehydrators. MEG recognizes that reducing methane is an important aspect of addressing climate change. MEG has implemented a fugitive emissions management plan for managing fugitive emission equipment leaks, a primary source of methane emissions. Leaks are documented, tracked and repaired.

A MEG cross-functional team (including engineering, environment, measurement, reservoir and production accounting) participated in the review to help shape an effective approach to methane regulation.

**Cost of management**
- 100,000

**Comment**
Potential annual cost for the Fugitive Emissions Program.

**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**

Resource efficiency

**Primary climate-related opportunity driver**

Use of more efficient production and distribution processes

**Type of financial impact**

Reduced operating costs (e.g., through efficiency gains and cost reductions)

**Company-specific description**

MEG operates in Alberta under the Climate Change and Emissions Management Act and the accompanying CCIR regulation for 2018. The CCIR replaced the SGER for compliance years 2018 and thereafter. SGER was an intensity-based facility-specific benchmark. The CCIR remains an emissions intensity-based regime requiring large emitters to reduce their emissions intensity below a prescribed level, or otherwise achieve this through a true-up obligation whereby credits can be applied against such required level, together with or as an alternative to physical abatement, with penalties for failure to achieve compliance. However, the CCIR has fundamental differences with SGER as the facility specific baselines in SGER have been replaced in the CCIR with product specific benchmarks set using top quartile performance from peers. The United Conservative Party (UCP) was elected to the GOA on April 16th, 2019 and stated they it replace the CCIR with a new system in early 2020. MEG will continue to monitor the outcomes and implications for MEG.

An opportunity exists for MEG to improve on the oil production performance standard thus earning Emissions Performance Credits, reduce fuel usage and capital costs, ultimately reducing operational costs. In 2018 MEG was able to generate emission performance credits. credits.

**Time horizon**

Short-term

**Likelihood**

Likely
Magnitude of impact
Low

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
2,381,970

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure
In 2018, CLRIP was able to generate a surplus of emission performance credits partially through efficiency gains realized from the expansion of eMSAGP and eMVAPEX from respective baseline performance. The potential financial impact is calculated as the value of the emission performance credits realized in 2018.

Strategy to realize opportunity
MEG places significant focus on optimizing steam generation to reduce greenhouse gas emissions and reduce fuel use. An important metric for this purpose is Steam-Oil Ratio (SOR), the quantity of steam used to produce a barrel of oil. SOR is a key measure of efficiency for SAGD projects, with a lower SOR indicating that steam is more efficiently utilized. By decreasing the amount of steam used, MEG is able to reduce our per barrel water and fuel requirements which results in lower GHG intensity and more economic projects.

With the SAGD industry average SOR is about 3 to 3.5, eMSAGP has enabled MEG to reduce its company-wide SOR to 2.19 for 2018. Technology continues to drive efficiency gains, resulting in cost and environmental performance improvements. This is reflected in our 2018 non-energy operating costs, which are some of the lowest in the business, at $4.62 per barrel, as well as year-over-year reductions in SOR and GHG intensity.

Cost to realize opportunity
89,774,000

Comment
Total of the net capital investment towards eMSAGP growth in 2018.
Identifier
Opp2

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

Opportunity type
Products and services

Primary climate-related opportunity driver
Development of new products or services through R&D and innovation

Type of financial impact
Better competitive position to reflect shifting consumer preferences, resulting in increased revenues

Company-specific description
In 2018, MEG further explored improving crude quality through upgrading technology and advancing recovery efficiencies with investment in R&D.

Time horizon
Short-term

Likelihood
Likely

Magnitude of impact
Medium

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

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure
Technology development is still underway and commercial scale implications are considered financially sensitive due to the proprietary nature of the technology.

Strategy to realize opportunity
MEG manages the potential cost impact associated with changes to GHG legislation by investing in reservoir enhancement technologies. One of these projects is eMVAPLEX. In 2018 MEG continued testing its proprietary eMVAPLEX technology. A modification of its eMSAGP technology, eMVAPLEX has the potential to further decrease MEG’s steam-oil ratio (SOR) beyond what eMSAGP can achieve, and further reduce GHG emissions.
intensities. SOR is a key measure of efficiency for SAGD projects, with a lower SOR indicating that the steam if more efficiently utilized. By decreasing the amount of steam used, MEG is able to reduce per barrel fuel requirements which results in lower GHG emissions intensity. MEG continued the advancement of eMVAPEX in 2018.

MEG has been granted funding from Alberta Innovates, Natural Resources Canada, Emissions Reductions Alberta, and Sustainable Development Technology Canada

<table>
<thead>
<tr>
<th>Cost to realize opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>64,829,000</td>
</tr>
</tbody>
</table>

**Comment**

MEG has been granted funding from Alberta Innovates, Natural Resources Canada, Emissions Reductions Alberta, and Sustainable Development Technology Canada for continued eMVAPEX work.

The 2018 annual capital program allocated $64 million to eMVAPEX growth capital. In 2019 MEG allocated $40 million to future growth projects including eMVAPEX.

**Identifier**

Opp3

**Where in the value chain does the opportunity occur?**

Direct operations

**Opportunity type**

Energy source

**Primary climate-related opportunity driver**

Use of lower-emission sources of energy

**Type of financial impact**

Reduced exposure to GHG emissions and therefore less sensitivity to changes in cost of carbon

**Company-specific description**

In 2015, the Government of Alberta introduced the Climate Leadership Plan to reduce carbon emissions which included a phase out of coal-generated electricity within the province by 2030. The electricity transition within the province outlines the need for approximately two-thirds of the replacement capacity to be comprised of natural gas generation. MEG has significant cogeneration capacity (provided through natural gas) that can add value and support the changing electricity market structure.

**Time horizon**

Medium-term

**Likelihood**
**Likely**

**Magnitude of impact**
Medium

**Are you able to provide a potential financial impact figure?**
Yes, a single figure estimate

**Potential financial impact figure (currency)**
42,747,992

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact figure**
The potential financial impact is calculated as the power sales price x power sales in 2018 as reported in the 2018 Annual Report.

**Strategy to realize opportunity**
Cogeneration is the process of recovering waste heat from electricity generation to efficiently produce steam. MEG operates two cogeneration facilities at its CLRP facility. Cogeneration uses natural gas more efficiently than standalone steam generators or single-cycle gas turbine generators. The steam generated from cogeneration is used for SAGD bitumen recovery and electricity to power the plant site, with excess power sold to Alberta’s power grid. The electricity provided to the power grid has a lower carbon footprint than the provincial average, helping to reduce total GHG intensity for provincial consumers. The use of cogeneration reduces the net greenhouse gas intensity of MEG’s oil and provides a stable source of baseload power as coal-fired generation is phased out in Alberta.

Reducing electrical power production below the electricity performance standard enables MEG to earn emissions performance credits that can offset costs.

**Cost to realize opportunity**
0

**Comment**
No additional investment in cogeneration were made in 2018.

---

**C2.5**

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

<table>
<thead>
<tr>
<th>Impact</th>
<th>Description</th>
</tr>
</thead>
</table>

---
**Products and services**

| Impacted | The climate change regulatory landscape has created an incentive for MEG to optimize its steam generation to reduce greenhouse gas emissions. SOR is a key measure of efficiency for SAGD projects, with a lower SOR indicating that steam is more efficiently utilized. By decreasing the amount of steam used, MEG is able to reduce our per barrel water and fuel requirements which results in lower greenhouse gas emissions intensity and more economic projects. MEG’s patented proprietary eMSAGP technology has been deployed at all phases and has enabled to reduce companywide SOR to 2.19 for 2018 (in comparison to a 3 to 3.5 industry average). eMSAGP has the potential to reduce SOR even further as eMSAGP continues to be implemented at Phase 2B. This technology allows MEG to provide a lower GHG emission intensity production to market. The magnitude of this identified opportunity is considered to be significant and the affect are anticipated to be realized in the short term timescale and beyond. |

**Supply chain and/or value chain**

| Impacted for some suppliers, facilities, or product lines | The Alberta Climate Leadership Act came into force on January 1, 2017 and established an Alberta carbon pricing regime in the form of a carbon levy on various types of fuel. Under the Climate Leadership Act, facilities subject to the CCIR are exempt from the carbon levy, this includes MEG’s Christina Lake facility. However, the levy does apply to MEG’s activities outside the CCIR facility. This includes fuel use by suppliers for activities such as drilling. The magnitude of this identified risk is considered to be low and since the pricing structure is currently in place, these impacts are experienced in the short term timescale. The United Conservative Party (UCP) was elected to the GOA on April 16th, 2019 and introduced Bill 1, An Act to Repeal the Carbon Tax on May 22, 2019. The carbon levy no longer applies to any type of fuel as of that time. Under the Greenhouse Gas Pollution Pricing Act, the federal government has established a cost per tonne of carbon on fuel use (Federal Fuel Charge) and a regulatory regime that will apply in jurisdictions where an equivalency is not in place. Alberta is re-designing elements of the carbon regime in 2019 and it is anticipated that the Federal backstop will not apply but this is yet to be determined. |

**Adaptation and mitigation activities**

| Not yet impacted | Physical risks from climate change can include event driven or longer-term shifts in climate patterns. Principal factors which could affect MEG’s operating results could include severe weather |
patterns, fires, lightning, earthquakes, extreme cold weather, storms and seasonal weather patterns and the corresponding effects of the spring thaw on accessibility to MEG's properties. Impacts of severe and seasonal weather patterns are identified in the ERM process and mitigated through engineering design operational procedures. However, MEG evaluates whether future physical climate changes have the potential to impact its operations and the need for adaptation or mitigation activities. The magnitude of this risk can range from low to high along with a timescale of short to long term may be expected.

The climate change regulatory landscape has created an opportunity for MEG to invest in R&D and innovation in reservoir technologies. MEG has been granted funding from Alberta Innovates, Natural Resources Canada, Emissions Reductions Alberta, and Sustainable Development Technology Canada for continued eMVAPEX work. Future growth capital allocates resources to the expansion of eMVAPEX. The magnitude of this identified opportunity has the potential to be significant with a medium to long term timescale.

<table>
<thead>
<tr>
<th>Investment in R&amp;D</th>
<th>Impacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>The climate change regulatory landscape has created an opportunity for MEG to invest in R&amp;D and innovation in reservoir technologies. MEG has been granted funding from Alberta Innovates, Natural Resources Canada, Emissions Reductions Alberta, and Sustainable Development Technology Canada for continued eMVAPEX work. Future growth capital allocates resources to the expansion of eMVAPEX. The magnitude of this identified opportunity has the potential to be significant with a medium to long term timescale.</td>
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<table>
<thead>
<tr>
<th>Operations</th>
<th>Impacted</th>
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<tbody>
<tr>
<td>In 2015, the Government of Alberta introduced the Climate Leadership Plan to reduce carbon emissions which included a phase out of coal-generated electricity within the province by 2030. The electricity transition within the province outlines the need for approximately two-thirds of the replacement capacity to be comprised of natural gas generation. MEG has significant cogeneration capacity (provided through natural gas) that can add value and support the changing electricity market structure. The magnitude of impact is anticipated to be moderate with a short – term and beyond timescale.</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Relevance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>The climate change regulatory landscape has created an opportunity for MEG to improve its oil production performance. MEG’s reservoir technologies, including eMSAGP, have helped reduce the capital intensities required for future growth by as much as half. The application of eMSAGP to the Phase 2B producing wells costs significantly less than the capital intensity required to complete large scale projects. This technology reduced GHG intensity as well as capital intensity. Future growth capital allocates resources to the further the expansion of eMSAGP. Maintaining a low SOR and GHG intensity have lowered energy costs, are allowing for capital deployment for sustaining projects, thus leaving the production base unaffected and stabilizing revenues. The magnitude of this identified opportunity is considered to be significant and the effect is anticipated to be realized in the short term timescale and beyond.</td>
</tr>
<tr>
<td>Operating costs</td>
<td>MEG conducts sensitivity analysis with respect to cost of carbon and climate change and the regulatory landscape has created an opportunity for MEG to improve its oil production performance. MEG’s reservoir technologies, including eMSAGP, have helped reduce the capital intensities required for future growth by as much as half. The application of eMSAGP to the Phase 2B producing wells costs significantly less than the capital intensity required to complete large scale projects. This technology reduced GHG intensity as well as capital intensity. Future growth capital allocates resources to the further the expansion of eMSAGP. The magnitude of this identified opportunity is considered to be significant and the effects are anticipated to be realized in the short term timescale and beyond.</td>
</tr>
<tr>
<td>Capital expenditures / capital allocation</td>
<td>The climate change regulatory landscape has created an opportunity for MEG to improve its oil production performance. MEG’s reservoir technologies, including eMSAGP, have helped reduce the capital intensities required for future growth by as much as half. The application of eMSAGP to the Phase 2B producing wells costs significantly less than the capital intensity required to complete large scale projects. This technology reduced GHG intensity as well as capital intensity. Future growth capital allocates resources to the further the expansion of eMSAGP. The magnitude of this identified opportunity is considered to be significant and the effects are anticipated to be realized in the short term timescale and beyond.</td>
</tr>
<tr>
<td>Acquisitions and divestments</td>
<td>Impacted</td>
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<tr>
<td>Access to capital</td>
<td>Impacted</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Assets</td>
<td>Impacted</td>
</tr>
<tr>
<td>Liabilities</td>
<td>Not yet impacted</td>
</tr>
</tbody>
</table>

**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?

No, and we do not anticipate doing so in the next two years

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.

Yes

C3.1c

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

i. Company specific explanation of how business objectives and strategy have been influenced by climate-related issues. MEG is adopting a systematic approach to addressing climate risk across its organization. MEG has built a strategy that allows it to objectively assess its business model against an ever-changing landscape of financial, legal and stakeholder pressures. Our goal is to find the business opportunities to strengthen economic outcomes promote technology advancements and demonstrate resiliency where there may be regulatory uncertainty.

Strategies include:

- Direction and oversight at the board level to ensure climate risks are factored into strategic business decisions,
- Continued investment in technologies that improve GHG performance, including co-generation and enhanced recovery methods.
- Active engagement on GHG policy development
- Establishing a set of actions which we expect will enable the company to reach a goal of improving corporate GHG performance to further our commitment to intensity reductions. This target is a component of MEG’s company level compensation package.

MEG manages the potential costs associated with GHG legislation by investing in reservoir enhancement technologies. MEG continued to advance reservoir recovery technologies in 2018. A significant portion of MEG’s 2018 capital program was allocated to the eMSAGP growth project at CLR P 2B. eMSAGP technology involves co-injecting a non-condensable gas into the reservoir with the steam. Once there is sufficient heat in the reservoir, non-condensable gas helps maintain pressure, reduces the SOR and frees up steam to be redeployed into new well pairs. This improves capital efficiency and reducing emissions. MEG also successfully completed phase 2 of a pilot of the eMVAPEX solvent recovery process. This proprietary
technology, if proven successful, will further enhance MEG’s growth potential by reducing capital requirements and operating costs, while minimizing environmental impacts. In 2018 the expanded eMVAPLEX pilot commenced and propane recycling facilities became fully operational. MEG has been granted funding from Alberta Innovates, Natural Resources Canada, Emissions Reductions Alberta, and Sustainable Development Technology Canada for continued eMVAPLEX work.

ii. Is your business strategy linked to an emissions reductions target or energy reduction target? The board establishes annual performance targets that in part, drive management compensation. In 2017 MEG added an environmental performance targets for GHG net intensity and spills. The targets were established to further the commitment to intensity reductions and environmental performances and will be reviewed at all meetings. In 2018, MEG met or surpassed these targets. The CCIR came into force January 1, 2018 and replaces the SGER for compliance years 2018 and thereafter. MEG tracks and forecasts its performance against the SGER/CCIR sector benchmarks. The UCP was elected to the GOA on April 16th, 2019 and plans to replace the CCIR with a new system in 2020. MEG will continue to monitor the outcomes and implications for MEG.

iii. What has been the most substantial business decisions made during the reporting year that have been influenced by the climate change driven aspects of the strategy (investment, R&D). MEG incorporates environmental considerations into all phases of our projects to manage risks that develop over time. Investment decisions and financial forecasts include carbon pricing and compliance costs associated with climate change regulations. Specifically, climate change risks are evaluated as part of project environmental impact assessments and help inform project facility design, including the use of co-generation, eMSAGP and eMVAPLEX. MEG’s business strategy recognizes the opportunity associated with increased energy efficiency in helping to mitigate carbon risks. The application of technology is enabling MEG to move away from large scale growth projects to more flexible growth. MEG’s growth strategy is more sustainable and continuous at lower capital costs intensities. With a focus on cost, operational and GHG efficiencies, future growth will utilize proprietary reservoir technologies enabling increased production and decrease GHG emissions. Rather than building large scale projects, MEG growth strategy focuses on efficiency to increase production and allocates significant capital investment to eMSAGP expansion to Phase 2B and continued eMVAPLEX testing and expansion. A significant portion of MEG’s 2018 capital program was allocated to the eMSAGP growth project at CLRP 2B. MEG has been granted funding from Alberta Innovates, Natural Resources Canada, Emissions Reductions Alberta, and Sustainable Development Technology Canada for continued eMVAPLEX work. Where MEG’s technologies have been deployed, 50% reductions in SOR have been observed, significantly lowering GHG emissions intensities.

iv. What aspects of climate change have influenced the strategy? Future costs associated with climate change policy and regulation, market access, and the potential for changing climate parameters (e.g. potential for increased precipitation in NE Alberta) have influenced the strategy and informed facility design. v. How has the short term business strategy been influenced? MEG manages the potential cost impact associated with changes to GHG legislation by investing in technologies including eMVAPLEX. By decreasing the amount of steam used, MEG is able to reduce per barrel fuel requirements resulting in lower GHG emissions intensity. Sufficient data on eMVAPLEX was collected which justified expanding the
MEG continued the deployment of eMSAGP technology and advancement of eMVAPEX in 2018.

vi. The most important components of the long term strategy (i.e. actions with a 10+ year time horizon) that have been influenced by climate change. MEG’s projects all have expected lifespans greater than 25 years. Investments in wells, equipment and technology (cogeneration facilities, eMSAGP, eMVAPEX) are evaluated for financial impact, including the potential impact of climate change regulations. Over the life of the project, the design and operation of our facilities are evaluated to manage the risks of changing climate. An example is the sizing of industrial runoff facilities to ensure sufficient capacity to manage potential increases in precipitation.

vii. How is this gaining you strategic advantage over your competitors  In 2018 MEG demonstrated its ability to be a top quartile performer with one of the lowest GHG emissions intensity operations in the in situ oil sands industry. This provides a financial and reputational advantage relative to our peers and will support continued growth opportunities in a carbon constrained economy. Gains in efficiency are reflected in best-in-class operating costs and lower risk profile with respect to compliance with new GHG regulation in Alberta.

MEG’s low carbon transition plan focuses on continued investment in technologies to improve GHG performance and meet external and internal GHG intensity targets. These include cogeneration and enhanced recovery methods such as eMSAGP and eMVAPEX. MEG is applying technology to move away from large scale growth projects to more flexible growth on a continuous basis. MEG’s new growth strategy is more sustainable and continuous at lower capital costs intensities. With a focus on cost, operational and GHG efficiencies, future growth will utilize proprietary reservoir technologies which will enable increased production and decrease GHG emissions. MEG growth strategy focuses on efficiency to increase production and allocates significant capital investment to eMSAGP expansion and continued eMVAPEX testing and expansion. MEG continued to advance reservoir recovery technologies in 2018 to support its growth. A significant portion of MEG’s 2018 capital program was allocated to the eMSAGP growth project at Christina Lake Phase 2B, the first in a series of high-return projects that will boost production while lowering the Corporation’s cash costs and environmental footprint. eMSAGP technology involves co-injecting a non-condensable gas into the reservoir with the steam. Once there is sufficient heat in the reservoir, the non-condensable gas helps
maintain pressure, reduces the SOR and frees up steam to be redeployed into new SAGD well pairs, thereby improving capital efficiency and reducing emissions. The Corporation also successfully completed phase 2 of a pilot of its new eMVAPEX solvent recovery process. This proprietary technology, if proven successful through expanded pilot operations, will further enhance MEG’s growth potential by reducing capital requirements and operating costs, while minimizing environmental impacts to land, air and water. In 2018 the expanded eMVAPEX pilot commenced and propane recycling facilities became fully operational. MEG has been granted funding from Alberta Innovates, Natural Resources Canada, Emissions Reductions Alberta, and Sustainable Development Technology Canada for continued eMVAPEX work.

C3.1g

(C3.1g) Why does your organization not use climate-related scenario analysis to inform your business strategy?

MEG recognizes the global shift towards embedding climate scenario analysis into an organizational strategy and has contemplated the merits at various levels within the company, including at the board level. The scope of such an undertaking has been seriously considered and the resourcing to complete a comprehensive and relevant study are not available at this time. This decision to defer a full-scale analysis is also balanced by what is understood to be the overall corporate exposure to the uncertainty surrounding climate-related issues. MEG operations are currently limited to NE Alberta where they are subject to a climate policy regime that is relatively advanced and well understood. For this reason, we have elected to continue to monitor and model climate-related impacts within the existing risk framework which includes exposures associated with physical change, market impacts, changes to government or policy, and disruptions to the supply chain.

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 |
% emissions in Scope
   100

Targeted % reduction from base year
   10.5

Metric
   Metric tons CO2e per barrel of oil equivalent (BOE)

Base year
   2013

Start year
   2018

Normalized base year emissions covered by target (metric tons CO2e)
   1,896,700

Target year
   2018

Is this a science-based target?
   No, and we do not anticipate setting one in the next 2 years

% of target achieved
   100

Target status
   New

Please explain
   As of January 1, 2018 the SGER regulation was replaced with the Alberta CCIR regulation, which has industry bitumen and electricity benchmark, rather than a facility specific benchmark. These became MEG’s targets in 2018. The Base year is actually 2013-2015.

% change anticipated in absolute Scope 1+2 emissions
   22

% change anticipated in absolute Scope 3 emissions
   0

Target reference number
   Int 2

Scope
   Scope 1

% emissions in Scope
100

**Targeted % reduction from base year**

5.1

**Metric**

Other, please specify

Net GHG Intensity Metric tons CO2e per barrel of oil equivalent (BOE)

**Base year**

2014

**Start year**

2018

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

2,064,100

**Target year**

2018

**Is this a science-based target?**

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

**% of target achieved**

100

**Target status**

New

**Please explain**

This is an internal target set by MEG as an element of the Corporate Performance Bonus Scorecard.

**% change anticipated in absolute Scope 1+2 emissions**

3.7

**% 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.

**C-OG4.2a**

(C-OG4.2a) If you do not have a methane-specific emissions reduction target for your oil and gas activities or do not incorporate methane into your target(s) reported in
C4.2 please explain why not and forecast how your methane emissions will change over the next five years.

In MEG’s operations, methane primarily results from releases of fugitive emissions while over 99% of greenhouse gas emissions are from combustion activities. These are captured in the intensity target referenced in CC4.1b which includes all associated methane emissions. This target captures methane emissions from combustion. Due to the small contribution of methane (from fugitives and venting) to MEG’s total scope 1 GHG emissions, MEG includes the methane target in the overall intensity target. MEG recognizes that reducing methane emissions is an important aspect of addressing climate change. MEG has implemented a fugitive emissions management plan for managing fugitive emissions from equipment leaks, a primary source of methane emissions. The plan utilizes a number of inspection techniques including comprehensive leak surveys, permanent instrument monitoring, and targeted monthly and quarterly monitoring. This has proven to be an effective approach to managing methane as it has consistently comprised less than 1% of total releases. Leaks are documented, tracked and repaired. In addition, MEG’s only operating CLRP facility is subject to gas conservation requirements, which means overall venting and flaring is virtually eliminated in normal operating conditions and only flaring or venting only results when it is necessary to maintain safe plant operations.

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.

<table>
<thead>
<tr>
<th>Initiative Stage</th>
<th>Number of initiatives</th>
<th>Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under investigation</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>To be implemented*</td>
<td>2</td>
<td>76,000</td>
</tr>
<tr>
<td>Implementation commenced*</td>
<td>1</td>
<td>212</td>
</tr>
<tr>
<td>Implemented*</td>
<td>2</td>
<td>5,409</td>
</tr>
<tr>
<td>Not to be implemented</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.
### Initiative type
- Fugitive emissions reductions

### Description of initiative
- Oil/natural gas methane leak capture/prevention

### Estimated annual CO2e savings (metric tonnes CO2e)
- 2,535

### Scope
- Scope 1

### Voluntary/Mandatory
- Voluntary

### Annual monetary savings (unit currency – as specified in C0.4)
- 76,050

### Investment required (unit currency – as specified in C0.4)
- 100,000

### Payback period
- 1-3 years

### Estimated lifetime of the initiative
- 6-10 years

### Comment

---

### Initiative type
- Fugitive emissions reductions

### Description of initiative
- Other, please specify
  - Process optimization

### Estimated annual CO2e savings (metric tonnes CO2e)
- 2,662

### Scope
- Scope 1

### Voluntary/Mandatory
- Voluntary

### Annual monetary savings (unit currency – as specified in C0.4)
79,860

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

10,000

Payback period

<1 year

Estimated lifetime of the initiative

6-10 years

Comment

C4.3c

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

<table>
<thead>
<tr>
<th>Method</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance with regulatory requirements/standards</td>
<td>As of January 1, 2018 MEG’s Christina Lake Regional Project is subject to Alberta’s CCIR regulation, which has industry bitumen and electricity benchmark, rather than a facility specific benchmark. These became MEG’s targets in 2018</td>
</tr>
<tr>
<td>Dedicated budget for energy efficiency</td>
<td>MEG has budgeted for future carbon compliance costs associated with Alberta’s CCIR requirements. MEG also carries annual budget to support investigation of emissions reduction opportunities, including joint industry partnerships. As of January 1, 2018 MEG’s Christina Lake Regional Project is subject to Alberta’s Specified Gas CCIR regulation, which has industry bitumen and electricity benchmark, rather than a facility specific benchmark. These became MEG’s targets in 2018</td>
</tr>
<tr>
<td>Internal price on carbon</td>
<td>MEG uses an internal price of carbon set at $30/tonne CO2e to forecast estimated compliance costs and potential savings associated with GHG emissions reduction opportunities which is in alignment with the existing carbon pricing structure applicable in Alberta where MEG operates.</td>
</tr>
<tr>
<td>Partnering with governments on technology development</td>
<td>MEG has been granted funding from Alberta Innovates, Natural Resources Canada, Emissions Reductions Alberta, and Sustainable Development Technology Canada for continued eMVAPLEX work.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Level of aggregation</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of product/Group of products</td>
<td>Electrical power</td>
</tr>
<tr>
<td>Are these low-carbon product(s) or do they enable avoided emissions?</td>
<td>Low-carbon product</td>
</tr>
<tr>
<td>Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions</td>
<td>CCIR cogen calculation methodology.</td>
</tr>
<tr>
<td>% revenue from low carbon product(s) in the reporting year</td>
<td></td>
</tr>
<tr>
<td>Comment</td>
<td>The Christina Lake Regional Project cogeneration facility uses natural gas more efficiently and produces two products; electricity and steam for oil production. The low-intensity electricity that we generate offsets the high-intensity coal-fired power prevalent on the Alberta power grid. Approximately 80% of electricity generated is sold to the Alberta power grid. Calculating emission reductions for cogeneration under the CCIR aligns with the Quantification Methodologies for the Carbon Competitiveness Incentive Regulation and the Specified Gas Reporting Regulation methodology document.</td>
</tr>
</tbody>
</table>

C-OG4.6

(C-OG4.6) Describe your organization’s efforts to reduce methane emissions from your activities.

MEG recognizes that reducing methane emissions is an important aspect to address climate change. MEG has implemented a fugitive emissions management plan for managing fugitive emissions from equipment leaks, a primary source of methane emissions. The plan utilizes a number of inspection techniques including comprehensive leak surveys, permanent instrument monitoring, targeted monthly and quarterly monitoring. This has proven to be an effective approach to managing methane as it has consistently comprised less than 1% of total releases.
Leaks are documented, tracked and repaired. For example, MEG has installed new models of valves for tanks which will further reduce methane emissions from venting and fugitives. In addition, MEG’s only operating CLRP facility is subject to gas conservation requirements, which means overall venting and flaring is virtually eliminated in normal operating conditions and only flaring or venting only results when it is necessary to maintain safe plant operations. In MEG’s operations, methane primarily results from releases of fugitive emissions while over 99% of MEG’s greenhouse gas emissions are from combustions activities. Less than 1% of combustion greenhouse gas emissions are methane. Combustion emissions are mainly due to steam generation and therefore, MEG places significant focus on optimizing steam generation to improve greenhouse gas emissions intensity. An important metric for this purpose is Steam-Oil Ratio (SOR), the quantity of steam used to produce a barrel of oil. SOR is a key measure of efficiency for SAGD projects, with a lower SOR indicating the steam is more efficiently utilized. By decreasing the amount of steam used, MEG is able to reduce fuel requirements which result in lower greenhouse gas emissions intensity. MEG has implemented its patented eMSAGP technology which has enabled MEG to achieve a companywide SOR or 2.19.

COG4.7

(C-OG4.7) Does your organization conduct leak detection and repair (LDAR) or use other methods to find and fix fugitive methane emissions from oil and gas production activities?
Yes

C-OG4.7a

(C-OG4.7a) Describe the protocol through which methane leak detection and repair or other leak detection methods, are conducted for oil and gas production activities, including predominant frequency of inspections, estimates of assets covered, and methodologies employed.

MEG recognizes that reducing methane emissions is an important aspect of address climate change. MEG has implemented a fugitive emissions management plan for managing fugitive emissions from equipment leaks, a primary source of methane emissions. The plan utilizes a number of inspection techniques including comprehensive leak surveys, permanent instrument monitoring, targeted monthly and quarterly monitoring. This has proven to be an effective approach to managing methane as it has consistently comprised less than 1% of total releases. Leaks are documented, tracked and repaired. For example, MEG has installed new models of valves for tanks which will further reduce methane emissions from venting and fugitives. The Fugitive Emissions Management Plan has been developed in accordance with CAPP Best Management Practice: Management of Fugitive Emissions at Upstream Oil and Gas Facilities (Requirements in AER Directive 60 as of 2018).

- Periodic Comprehensive Surveys – comprehensive leak survey of each facility is performed every 3 to 5 years using either an infrared thermal imaging camera or US EPA Method 21.
- Targeted Quarterly and Annual Monitoring – Regular targeted monitoring is performed on all components having a medium to high leak potential. This is done on a monthly and quarterly
basis according to the types of components, their specific leak potentials and their ongoing leak performance.

- Permanent Instrumented Monitoring - MEG currently has instrumented monitoring systems on difficult-to-access components having a high leak potential.

The numbers of leaks detected annually by the proposed monitoring program will be tracked as a performance indicator. An engineering review of any chronic leakers will be performed, when required, to determine more appropriate control measures (e.g., replacement of the component with a more robust or rugged design or installation of a leak capture and treatment system).

C-OG4.8

(C-OG4.8) If flaring is relevant to your oil and gas production activities, describe your organization’s efforts to reduce flaring, including any flaring reduction targets.

MEG’s facility is a gas conserving facility, which means overall venting and flaring is virtually eliminated in normal operating conditions. MEG has a gas conservation efficiency target of 90% where gas conservation = (Solution gas production – Flared – Vented) / (Solution gas production) × 100. In 2018 MEG had an overall gas conservation of >95%. MEG only flares or vents when it is absolutely necessary to maintain safe plant operations. In 2018 GHG emissions from flaring activities contributed to 0.25% of MEG’s total GHG emissions. Flaring is not relevant to MEG’s activities.

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, 2013

Base year end
December 31, 2013

Base year emissions (metric tons CO2e)
1,896,700

Comment
Normalized annual emissions over baseline period.
Base year start is 01/01/2013 and base year end is 12/31/2015.

Scope 2 (location-based)

Base year start
January 1, 2013

Base year end


December 31, 2013

**Base year emissions (metric tons CO2e)**

500

**Comment**

Normalized annual scope 2 emissions over baseline period.
Base year start is 01/01/2013 and base year end is 12/31/2015.

**Scope 2 (market-based)**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

**C5.2**

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

- Other, please specify

**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.**

- Environment Canada: Canada's Greenhouse Gas Inventory
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) | 2,140,537 |
| 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 have operations where we are able to access electricity supplier emission factors or residual emissions factors, but are unable to report a Scope 2, market-based figure

Comment
Market-based information is not available from our electricity provider.

C6.3

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

Reporting year

| Scope 2, location-based | 22 |
| 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?

No

C6.5

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

Purchased goods and services

Evaluation status
Relevant, calculated

Metric tonnes CO2e
6,083

Emissions calculation methodology
Fuel usage is obtained from suppliers or from MEGs internal fuel usage tracking system.

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

Explanation
Fuel usage for drilling activities.

Capital goods

Evaluation status
Not evaluated

Explanation

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

Evaluation status
Relevant, calculated

Metric tonnes CO2e
17,745

**Emissions calculation methodology**

Fuel usage is obtained from suppliers or from MEGs internal fuel usage tracking system. Fuel usage is obtained from suppliers or from MEGs internal fuel usage tracking system.

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

0

**Explanation**

This includes miscellaneous equipment such as heaters, site service equipment, camp site and site service heating, and fuel used for projects, drilling and completions activities.

**Upstream transportation and distribution**

**Evaluation status**

Not relevant, explanation provided

**Explanation**

MEG extracts primary resources (Bitumen) and therefore minimal upstream transportation or distribution emissions exist. This category is not applicable to MEG.

**Waste generated in operations**

**Evaluation status**

Not evaluated

**Explanation**

**Business travel**

**Evaluation status**

Relevant, calculated

**Metric tonnes CO2e**

7,711

**Emissions calculation methodology**

Fuel usage is obtained from suppliers or from MEGs internal fuel usage tracking system.

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

0

**Explanation**

This includes air travel, transportation to site and on site transportation.

**Employee commuting**
Evaluation status
Relevant, not yet calculated

Explanation

Upstream leased assets

Evaluation status
Relevant, calculated

Metric tonnes CO2e
948

Emissions calculation methodology
Head office natural gas for heat and electricity usage obtained from head office management company.

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

Explanation
This includes emissions at MEG’s head office including emissions from electricity use and natural gas for heating.

Downstream transportation and distribution

Evaluation status
Relevant, calculated

Metric tonnes CO2e
30

Emissions calculation methodology
Fuel usage obtained from value chain partner.

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

Explanation
This includes emission downstream storage emissions.

Processing of sold products

Evaluation status
Relevant, not yet calculated

Explanation
MEG bitumen is processed in various upgrading and refining facilities in North America.
Use of sold products

Evaluation status
Relevant, not yet calculated

Explanation
Oil produced by MEG is used as a feedstock for a number of products thus end use of sold products is not known to MEG and could include transportation fuels, plastics, chemicals and other hydrocarbon-based products. The Scope 3 emissions will vary based on end product.

End of life treatment of sold products

Evaluation status
Relevant, not yet calculated

Explanation
Oil produced by MEG is used for a number of products thus end of life treatment of sold products is not known to MEG and could include transportation fuels, plastics, chemicals and other hydrocarbon-based products. The Scope 3 emissions for end of life treatment will vary based on the end product. Not relevant, explanation provided

Downstream leased assets

Evaluation status
Not relevant, explanation provided

Explanation
MEG does not own any downstream leased assets. This category is not applicable to MEG.

Franchises

Evaluation status
Not relevant, explanation provided

Explanation
MEG does not operate any franchises. This category is not applicable to MEG.

Investments

Evaluation status
Not relevant, explanation provided

Explanation
MEG is not a financial institution. This category is not applicable to MEG.

Other (upstream)

Evaluation status
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
0.00078

Metric numerator (Gross global combined Scope 1 and 2 emissions)
2,140,559

Metric denominator
unit total revenue

Metric denominator: Unit total
2,732,700

Scope 2 figure used
Location-based

% change from previous year
5.4

Direction of change
Decreased

Reason for change
The increase in revenue drove down emissions intensity resulting in a 5.4% decrease from previous year.
MEG’s application of its emission reduction technology, eMSAGP is continuing to
improve operational performance and GHG performance.

<table>
<thead>
<tr>
<th>Intensity figure</th>
<th>0.051</th>
</tr>
</thead>
</table>

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

1,637,373

**Metric denominator**

barrel of oil equivalent (BOE)

**Metric denominator: Unit total**

32,019,847

**Scope 2 figure used**

Location-based

**% change from previous year**

1

**Direction of change**

Decreased

**Reason for change**

Bitumen production increased while greenhouse gas emissions intensity decreased as a result of cogeneration and eMSAGP implementation.

**C-OG6.12**

*(C-OG6.12)* Provide the intensity figures for Scope 1 emissions (metric tons CO2e) per unit of hydrocarbon category.

<table>
<thead>
<tr>
<th>Unit of hydrocarbon category (denominator)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thousand barrels of oil sands (includes bitumen and synthetic crude)</td>
</tr>
</tbody>
</table>

**Metric tons CO2e from hydrocarbon category per unit specified**

0.05

**% change from previous year**

1

**Direction of change**

Decreased

**Reason for change**
Bitumen production increased while greenhouse gas emissions intensity decreased as a result of cogeneration and eMSAGP implementation.

Comment

C-OG6.13

(C-OG6.13) Report your methane emissions as percentages of natural gas and hydrocarbon production or throughput.

Oil and gas business division
Upstream

Estimated total methane emitted expressed as % of natural gas production or throughput at given division
0.067

Estimated total methane emitted expressed as % of total hydrocarbon production or throughput at given division
0.067

Comment
Reflects fugitive methane release as a proportion of total purchased natural gas throughput.

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).

<table>
<thead>
<tr>
<th>Greenhouse gas</th>
<th>Scope 1 emissions (metric tons of CO2e)</th>
<th>GWP Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2</td>
<td>2,124,115</td>
<td>IPCC Fourth Assessment Report (AR4 - 100 year)</td>
</tr>
<tr>
<td>CH4</td>
<td>13,573</td>
<td>IPCC Fourth Assessment Report (AR4 - 100 year)</td>
</tr>
</tbody>
</table>
C-OG7.1b

(C-OG7.1b) Break down your total gross global Scope 1 emissions from oil and gas value chain production activities by greenhouse gas type.

<table>
<thead>
<tr>
<th>Emissions category</th>
<th>Combustion (excluding flaring)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value chain</td>
<td>Upstream</td>
</tr>
<tr>
<td>Product</td>
<td>Oil</td>
</tr>
<tr>
<td>Gross Scope 1 CO2 emissions (metric tons CO2)</td>
<td>2,114,581</td>
</tr>
<tr>
<td>Gross Scope 1 methane emissions (metric tons CH4)</td>
<td>77</td>
</tr>
<tr>
<td>Total gross Scope 1 emissions (metric tons CO2e)</td>
<td>2,124,115</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comment</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Emissions category</th>
<th>Fugitves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value chain</td>
<td>Upstream</td>
</tr>
<tr>
<td>Product</td>
<td>Oil</td>
</tr>
<tr>
<td>Gross Scope 1 CO2 emissions (metric tons CO2)</td>
<td>4</td>
</tr>
<tr>
<td>Gross Scope 1 methane emissions (metric tons CH4)</td>
<td>413</td>
</tr>
<tr>
<td>Total gross Scope 1 emissions (metric tons CO2e)</td>
<td>10,329</td>
</tr>
<tr>
<td>Emissions category</td>
<td>Value chain</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Flaring</td>
<td>Upstream</td>
</tr>
<tr>
<td>Venting</td>
<td>Upstream</td>
</tr>
</tbody>
</table>
MEG Energy Corp. CDP Climate Change Questionnaire 2019 Wednesday, December 4, 2019

Other (please specify)
Waste and wastewater

Value chain
Upstream

Product
Oil

Gross Scope 1 CO2 emissions (metric tons CO2)
0

Gross Scope 1 methane emissions (metric tons CH4)
2

Total gross Scope 1 emissions (metric tons CO2e)
58

Comment
Waste and wastewater ponds contain microbial communities that are capable of producing methane. MEG’s produced water ponds release a negligible source of GHG emissions.

C7.2

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

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Scope 1 emissions (metric tons CO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>2,140,537</td>
</tr>
</tbody>
</table>

C7.3

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

By facility
By activity

C7.3b

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

<table>
<thead>
<tr>
<th>Facility</th>
<th>Scope 1 emissions (metric tons CO2e)</th>
<th>Latitude</th>
<th>Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLRP</td>
<td>2,140,537</td>
<td>55.66638</td>
<td>-110.71404</td>
</tr>
</tbody>
</table>

C7.3c

(C7.3c) Break down your total gross global Scope 1 emissions by business activity.
Electric utility generation activities 1,197,811
Oil and gas production activities (upstream)** 942,727

** 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.

<table>
<thead>
<tr>
<th>Sector Production Activity</th>
<th>Gross Scope 1 emissions, metric tons CO2e</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil and gas production activities (upstream)**</td>
<td>1,197,811</td>
<td></td>
</tr>
<tr>
<td>Oil and gas production activities (downstream)</td>
<td>942,727</td>
<td></td>
</tr>
</tbody>
</table>

C7.5

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

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Scope 2, location-based (metric tons CO2e)</th>
<th>Scope 2, market-based (metric tons CO2e)</th>
<th>Purchased and consumed electricity, heat, steam or cooling (MWh)</th>
<th>Purchased and consumed low-carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>22</td>
<td>0</td>
<td>27</td>
<td>0</td>
</tr>
</tbody>
</table>

C7.6

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

By facility

C7.6b

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

<table>
<thead>
<tr>
<th>Facility</th>
<th>Scope 2 location-based emissions (metric tons CO2e)</th>
<th>Scope 2, market-based emissions (metric tons CO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLRP</td>
<td>22</td>
<td>0</td>
</tr>
</tbody>
</table>
Break down your organization’s total gross global Scope 2 emissions by sector production activity in metric tons CO2e.

<table>
<thead>
<tr>
<th>Sector Production Activity</th>
<th>Scope 2, location-based, metric tons CO2e</th>
<th>Scope 2, market-based (if applicable), metric tons CO2e</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil and gas production activities (upstream)</td>
<td>22</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Oil and gas production activities (downstream)</td>
<td>0</td>
<td>0</td>
<td>Not applicable to MEG.</td>
</tr>
</tbody>
</table>

(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) 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.

<table>
<thead>
<tr>
<th>Change in emissions (metric tons CO2e)</th>
<th>Direction of change</th>
<th>Emissions value (percentage)</th>
<th>Please explain calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in renewable energy consumption</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other emissions reduction activities</td>
<td>33,500</td>
<td>Decreased 2</td>
<td>Normalized emissions decrease resulting from eMSAGP deployment at newer production wells and piloting of eMVAPEX</td>
</tr>
<tr>
<td>Divestment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquisitions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mergers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in output</td>
<td>32,200</td>
<td>Increased 4.5</td>
<td>Emissions increase resulting from the addition of new wells</td>
</tr>
</tbody>
</table>
and production. Absolute production growth was approximately 8.6% year to year.

| Change in methodology |  |
| Change in boundary |  |
| Change in physical operating conditions |  |
| Unidentified |  |
| Other | New sustaining production brought online with higher initial recovery efficiencies, which will decrease through time. |

C7.9b

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

- Location-based

C8. Energy

C8.1

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

- More than 25% but less than or equal to 30%

C8.2

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

<table>
<thead>
<tr>
<th>Energy-Related Activity</th>
<th>Indicate whether your organization undertakes this energy-related activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumption of fuel (excluding feedstocks)</td>
<td>Yes</td>
</tr>
<tr>
<td>Consumption of purchased or acquired electricity</td>
<td>Yes</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Heating value</th>
<th>MWh from renewable sources</th>
<th>MWh from non-renewable sources</th>
<th>Total MWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumption of fuel (excluding feedstock)</td>
<td>HHV (higher heating value)</td>
<td>0</td>
<td>10,401,569</td>
</tr>
<tr>
<td>Consumption of purchased or acquired electricity</td>
<td></td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td>Consumption of self-generated non-fuel renewable energy</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total energy consumption</td>
<td></td>
<td>0</td>
<td>10,401,596</td>
</tr>
</tbody>
</table>

**C8.2b**

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

<table>
<thead>
<tr>
<th></th>
<th>Indicate whether your organization undertakes this fuel application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumption of fuel for the generation of electricity</td>
<td>No</td>
</tr>
<tr>
<td>Consumption of fuel for the generation of heat</td>
<td>Yes</td>
</tr>
<tr>
<td>Consumption of fuel for the generation of steam</td>
<td>Yes</td>
</tr>
<tr>
<td>Consumption of fuel for the generation of cooling</td>
<td>No</td>
</tr>
<tr>
<td>Consumption of fuel for co-generation or tri-generation</td>
<td>Yes</td>
</tr>
</tbody>
</table>
C8.2c

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

Fuels (excluding feedstocks)
   Natural Gas

Heating value
   HHV (higher heating value)

Total fuel MWh consumed by the organization
   11,144,618

MWh fuel consumed for self-generation of heat
   281,463

MWh fuel consumed for self-generation of steam
   4,469,849

MWh fuel consumed for self-cogeneration or self-trigeneration
   6,393,306

Comment

Fuels (excluding feedstocks)
   Diesel

Heating value
   HHV (higher heating value)

Total fuel MWh consumed by the organization
   4,079

MWh fuel consumed for self-generation of heat
   4,079

MWh fuel consumed for self-generation of steam
   0

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**

<table>
<thead>
<tr>
<th>Emission factor</th>
<th>0.00262</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>metric tons CO2e per liter</td>
</tr>
</tbody>
</table>

**Emission factor source**

Quantification Methodologies for the Carbon competitiveness Incentive Regulation and the Specified Gas Reporting Regulation (2018)

**Comment**

**Natural Gas**

<table>
<thead>
<tr>
<th>Emission factor</th>
<th>0.00214</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>metric tons CO2 per m3</td>
</tr>
</tbody>
</table>

**Emission factor source**

CH4 and N2O Emission Factors source: Environment Canada, Canada’s Greenhouse Gas Inventory (1990-2014) Table A8–2: Emission Factors for Natural Gas

CO2 – the Natural gas CO2 emission factor is derived from fuel carbon content and varies.

**Comment**

C8.2e

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

<table>
<thead>
<tr>
<th></th>
<th>Total Gross generation (MWh)</th>
<th>Generation that is consumed by the organization (MWh)</th>
<th>Gross generation from renewable sources (MWh)</th>
<th>Generation from renewable sources that is consumed by the organization (MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electricity</strong></td>
<td>1,298,444</td>
<td>301,317</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Heat</strong></td>
<td>225,171</td>
<td>225,171</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Basis for applying a low-carbon emission factor</th>
<th>No purchases or generation of low-carbon electricity, heat, steam or cooling accounted with a low-carbon emission factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-carbon technology type</td>
<td></td>
</tr>
<tr>
<td>Region of consumption of low-carbon electricity, heat, steam or cooling</td>
<td></td>
</tr>
<tr>
<td>MWh consumed associated with low-carbon electricity, heat, steam or cooling</td>
<td></td>
</tr>
<tr>
<td>Emission factor (in units of metric tons CO2e per MWh)</td>
<td></td>
</tr>
<tr>
<td>Comment</td>
<td></td>
</tr>
</tbody>
</table>

C9. Additional metrics

C9.1

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

C-OG9.2a

(C-OG9.2a) Disclose your net liquid and gas hydrocarbon production (total of subsidiaries and equity-accounted entities).

<table>
<thead>
<tr>
<th>In-year net production</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude oil and condensate, million barrels</td>
<td>0</td>
</tr>
</tbody>
</table>
Natural gas liquids, million barrels | 0 | MEG is a pure play oil sands producer
Oil sands, million barrels (includes bitumen and synthetic crude) | 32.02 | MEG is a pure play oil sands producer
Natural gas, billion cubic feet | 0 | MEG is a pure play oil sands producer

**C-OG9.2b**

(C-OG9.2b) Explain which listing requirements or other methodologies you use to report reserves data. If your organization cannot provide data due to legal restrictions on reporting reserves figures in certain countries, please explain this.

MEG reports its reserves and other oil and gas information in accordance with the National Instruments 51-101 – Standards for Disclosure for Oil and Gas Activities, the standard governing and reporting of petroleum reserves and resources for Canadian publicly traded companies. The Instrument requires all Canadian reporting issuers engaged in oil and gas activity to provide disclosure of their estimated oil and natural gas reserves and related future net revenues on an annual basis; and all disclosure to be prepared or audited in accordance with the Canadian Oil and Gas Evaluation Handbook.

**C-OG9.2c**

(C-OG9.2c) Disclose your estimated total net reserves and resource base (million boe), including the total associated with subsidiaries and equity-accounted entities.

<table>
<thead>
<tr>
<th>Estimated total net proved + probable reserves (2P) (million BOE)</th>
<th>Estimated total net proved + probable + possible reserves (3P) (million BOE)</th>
<th>Estimated net total resource base (million BOE)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row 1</td>
<td>2,079</td>
<td>1,810</td>
<td>Independent evaluation as at December 31, 2018; net of royalties</td>
</tr>
</tbody>
</table>

**C-OG9.2d**

(C-OG9.2d) Provide an indicative percentage split for 2P, 3P reserves, and total resource base by hydrocarbon categories.

<table>
<thead>
<tr>
<th>Crude oil / condensate / Natural gas liquids</th>
<th>Net proved + probable reserves (2P) (%)</th>
<th>Net proved + probable + possible reserves (3P) (%)</th>
<th>Net total resource base (%)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>MEG is a pure play oil sands producer</td>
</tr>
</tbody>
</table>
Natural gas  0  0  0  MEG is a pure play oil sands producer

Oil sands (includes bitumen and synthetic crude)  100  100  100  MEG is a pure play oil sands producer

**C-OG9.2e**

(C-OG9.2e) Provide an indicative percentage split for production, 1P, 2P, 3P reserves, and total resource base by development types.

<table>
<thead>
<tr>
<th>Development type</th>
<th>Oil sand/extra heavy oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-year net production (%)</td>
<td>100</td>
</tr>
<tr>
<td>Net proved reserves (1P) (%)</td>
<td>100</td>
</tr>
<tr>
<td>Net proved + probable reserves (2P) (%)</td>
<td>100</td>
</tr>
<tr>
<td>Net proved + probable + possible reserves (3P) (%)</td>
<td>100</td>
</tr>
<tr>
<td>Net total resource base (%)</td>
<td>100</td>
</tr>
</tbody>
</table>

**Comment**

MEG is a pure play oil sands producer.

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

(C-CO9.6/C-EU9.6/C-OG9.6) Disclose your investments in low-carbon research and development (R&D), equipment, products, and services.

**Investment start date**

January 1, 2018

**Investment end date**

December 1, 2018

**Investment area**
**Equipment**

**Technology area**  
Other energy efficiency measures in the oil and gas value chain

**Investment maturity**  
Pilot demonstration

**Investment figure**  
64,829,000

**Low-carbon investment percentage**  
81-100%

**Please explain**  
MEG successfully completed phase 2 of a pilot of its new eMVAPEX solvent recovery process. This proprietary technology, if proven successful through expanded pilot operations, will further enhance MEG’s growth potential by reducing capital requirements and operating costs, while minimizing environmental impacts to land, air and water. In 2018 the expanded eMVAPEX pilot commenced and propane recycling facilities became fully operational. MEG has been granted funding from Alberta Innovates, Natural Resources Canada, Emissions Reductions Alberta, and Sustainable Development Technology Canada for continued eMVAPEX work.

---

**Investment start date**  
January 1, 2018

**Investment end date**  
December 1, 2018

**Investment area**  
R&D

**Technology area**  
Other energy efficiency measures in the oil and gas value chain

**Investment maturity**  
Applied research and development

**Investment figure**  
5,509,000

**Low-carbon investment percentage**  
81-100%

**Please explain**  
Research and development expenditures relate to the corporation’s research of crude quality improvement and related technologies.
C-OG9.7

(C-OG9.7) Disclose the breakeven price (US$/BOE) required for cash neutrality during the reporting year, i.e. where cash flow from operations covers CAPEX and dividends paid/ share buybacks.

C10. Verification

C10.1

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

<table>
<thead>
<tr>
<th>Scope</th>
<th>Verification/assurance status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope 1</td>
<td>Third-party verification or assurance process in place</td>
</tr>
<tr>
<td>Scope 2 (location-based or market-based)</td>
<td>Third-party verification or assurance process in place</td>
</tr>
<tr>
<td>Scope 3</td>
<td>Third-party verification or assurance process in place</td>
</tr>
</tbody>
</table>

C10.1a

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

---

**Scope**
- Scope 1

**Verification or assurance cycle in place**
- Annual process

**Status in the current reporting year**
- Complete

**Type of verification or assurance**
- Reasonable assurance

**Attach the statement**

10.1b Scope 1 VR.pdf

**Page/ section reference**
- 1

**Relevant standard**
- Other, please specify
Alberta CCIR

Proportion of reported emissions verified (%)
100

Scope
Scope 2 location-based

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Reasonable assurance

Attach the statement

10.1b Scope 2 VR.pdf

Page/ section reference
1-2

Relevant standard
Other, please specify
CPA - Standards for Assurance Engagement

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- all relevant categories

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Attach the statement
**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?

<table>
<thead>
<tr>
<th>Disclosure module verification relates to</th>
<th>Data verified</th>
<th>Verification standard</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>C4. Targets and performance</td>
<td>Progress against emissions reduction target</td>
<td>● Alberta CCIR ● ISO14064-3</td>
<td>Question C4.1b</td>
</tr>
</tbody>
</table>

The target is derived from the Alberta Specified Gas Emitters Regulation. The regulation requires that facilities emitting greater than 100,000 tonnes of CO2e per year reduce their emissions by 20% from base year emissions by 2017. 2017 is the last year of the SGER regulation in Alberta. As of January 1, 2018 the SGER regulation was replaced with the Alberta CCIR regulation, which has industry bitumen and electricity benchmark, rather than a facility specific benchmark. These will become MEG’s targets in 2018.

Verification for CCIR was completed annually. This is a reasonable level of assurance.
C6. Emissions data

- Year on year emissions intensity figure
- Other: Canadian Professional Accountants – Standards for Assurance Engagements other than audits of Financial Statements and other Historical Financial Information, Handbook Section 5025.

Question C6.10, Question C6.12 Verification completed annually at a reasonable level of assurance.

C7. Emissions breakdown

- Year on year change in emissions (Scope 1)
- Alberta CCIR
- ISO14064-3

Question C7.9 Verification completed annually at a reasonable level of assurance.
MEG’s CLRP facility falls under the CCIR regulation in Alberta.

C7. Emissions breakdown

- Year on year change in emissions (Scope 2)
- Alberta CCIR
- ISO14064-3

Question C7.9 Verification completed annually at a reasonable level of assurance.

C11. Carbon pricing

C11.1

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

Yes

C11.1a

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.
Alta ETS, please specify
Alberta CCIR

C11.1b

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

Other ETS, please specify

% of Scope 1 emissions covered by the ETS
Period start date

Period end date

Allowances allocated
1,850,999

Allowances purchased
0

Verified emissions in metric tons CO2e
1,771,532

Details of ownership
Facilities we own and operate

Comment
Alberta CCIR (Replaced Alberta SGER).

C11.1c

(C11.1c) Complete the following table for each of the tax systems in which you participate.

Alberta carbon tax

<table>
<thead>
<tr>
<th>Period start date</th>
<th>January 1, 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period end date</td>
<td>December 31, 2018</td>
</tr>
<tr>
<td>% of emissions covered by tax</td>
<td>31</td>
</tr>
<tr>
<td>Total cost of tax paid</td>
<td>303,000</td>
</tr>
</tbody>
</table>

Comment
% of emissions covered by tax is the taxed emissions over the total scope 3 emissions within MEG’s boundary.

C11.1d

(C11.1d) What is your strategy for complying with the systems in which you participate or anticipate participating?
MEG is managing compliance with regulations by minimizing emissions. This is accomplished through operation of cogeneration facilities and implementation of reservoir production enhancements. MEG places significant focus on optimizing steam generation to improve environmental outcomes. An important metric for this purpose is Steam-Oil Ratio (SOR), the quantity of steam used to produce a barrel of oil. SOR is a key measure of efficiency for SAGD projects, with a lower SOR indicating that steam is more efficiently utilized. By decreasing the amount of steam used, MEG is able to reduce our per barrel water and fuel requirements which results in lower greenhouse gas emissions intensity and more economic projects. MEG increased the application of its patented eMSAGP reservoir production technology across additional production wells. eMSAGP has improved operational performance and reduced costs, including GHG costs linked to an increasingly stringent intensity target. In addition MEG, with grants from Alberta Innovates, Natural Resources Canada, Emissions Reductions Alberta, and Sustainable Development Technology Canada MEG has advanced the development of the Enhanced Modified Vapour Extraction (eMVAPEX) production technology. The main objectives of eMVAPEX technology are to efficiently increase MEG’s bitumen production rate, achieve sustainable cost savings and minimize environmental impacts to land, air and water. Early evaluation of eMVAPEX is currently capturing the GHG reduction benefits in the economic evaluation of the technology development.

C11.2

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

Yes

C11.2a

(C11.2a) Provide details of the project-based carbon credits originated or purchased by your organization in the reporting period.

Credit origination or credit purchase

Credit origination

Project type

Energy efficiency: industry

Project identification

eMSAGP and Cogeneration

Verified to which standard

Other, please specify


Number of credits (metric tonnes CO2e)
79,399

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

79,399

**Credits cancelled**

No

**Purpose, e.g. compliance**

Compliance

**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
- Drive energy efficiency
- Drive low-carbon investment

**GHG Scope**

Scope 1

**Application**

MEG uses an internal price of carbon in risk and opportunity economic assessment for capital and operational investments. MEG has an internal team that monitors and reviews carbon market trends and pricing. MEG undertakes scenario analysis on various carbon prices to ensure that the internal price of carbon reflects the regulatory and economic environment in which it operates.

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

30

**Variance of price(s) used**

MEG applies evolutionary pricing to reflect the regulatory and economic environment in which it operates. MEG operated in Alberta, under the Climate Change and Emissions Management Act and the accompanying CCIR regulation. The CCIR is an emissions intensity-based regime requiring large emitters to reduce their emissions intensity below a prescribed level, or otherwise achieve this through a true-up obligation whereby credits can be applied against such required level, together with or as an alternative to physical abatement, with penalties for failure to achieve compliance. The CCIR has product
specific benchmarks. The CCIR compliance cost begins with $30 per tonne of carbon. The cost of compliance is anticipated to increase in line with the Federal Pan-Canadian Carbon Plan, that escalates up to $50 per tonne in 2022. In addition to the CCIR, Alberta’s Climate Leadership Plan includes the Carbon levy which is charged to all transpiration and heating fuel used in activities not captured within the CCIR scope. The levy rate in 2017 when the program first came into effect was $20/tonne and increased to $30/tonne in 2018.

**Type of internal carbon price**

- Shadow price

**Impact & implication**

The internal carbon price is used to help manage the potential cost impact associated with GHG legislation. Through its operational efficiency projects MEG has built substantial GHG credits given the high performance of its facilities.

One of MEG’s operational efficiency projects is eMVAPEX. In 2018 MEG continued testing its proprietary eMVAPEX technology. A modification of its eMSAGP technology, eMVAPEX has the potential to further decrease MEG’s steam-oil ratio (SOR) beyond what eMSAGP can achieve, and further reduce GHG emissions intensities.

SOR is a key measure of efficiency for SAGD projects, with a lower SOR indicating that the steam is more efficiently utilized. By decreasing the amount of steam used, MEG is able to reduce per barrel fuel requirements which results in lower GHG emissions intensity.

MEG has been granted funding from Alberta Innovates, Natural Resources Canada, Emissions Reductions Alberta, and Sustainable Development Technology Canada for continued eMVAPEX work.

**C12. Engagement**

**C12.1**

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

No, we do not engage

**C12.1d**

*(C12.1d) Why do you not engage with any elements of your value chain on climate-related issues, and what are your plans to do so in the future?*

Currently MEG produces diluted bitumen that is transported to, and processed in, various downstream facilities. Oil produced by MEG is used as a feedstock for a number of products, thus end use of sold products is not known to MEG making it difficult to engage with customers.
in MEG’s value chain. MEG is however, exploring opportunities for supplier engagement including compliance & onboarding and engagement campaigns to educate suppliers about climate change.

**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

**C12.3a**

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

<table>
<thead>
<tr>
<th>Focus of legislation</th>
<th>Corporate position</th>
<th>Details of engagement</th>
<th>Proposed legislative solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other, please specify</td>
<td>Support</td>
<td>MEG engages directly with Federal and Provincial Governments on policy and regulatory issues. We provide input into new policy, directives and regulations, as well as existing regulations when they are under review in order to properly reflect a balanced approach to sustainable development. MEG was an active participant in the Government of Alberta’s Climate Leadership Plan consultation and working groups. MEG is also an active participant in the Government of Canada’s Pan-Canadian Framework on Clean Growth and Climate Change consultation and working groups. MEG also actively engages the Alberta Energy Regulator as it develops policy. MEG consulted on the new AER methane requirements that come into effect January 1, 2020 under MEG is committed to responsible resource development and remaining at the forefront of technology innovation, development and deployment. We are pursuing this not only in reservoir technology, but throughout the value chain in value added processing and across industrial sectors into power generation through cogeneration. In each area our desire is the same – improve energy efficiency to reduce costs and GHG emissions. A collaborative approach to enhance competitiveness and GHG emissions reductions by recognizing and encouraging investment in technology and innovation is required.</td>
<td></td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Trade association</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Canadian Association of Petroleum Producers (CAPP)</td>
<td></td>
</tr>
</tbody>
</table>

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association’s position

Under CAPP's Climate Change Policy Principles, Canada’s oil and natural gas producers are ready and willing to do their part to contribute to the overall Canadian plan on climate change. CAPP will proactively collaborate with governments and stakeholder towards appropriate policy solutions. Policy should be efficient, effective and predictable. It should target reductions where they are most efficient and effective right across the entire energy value change from production to end use and considering fairly all sectors and jurisdictions. Policies should achieve emission reductions at least cost to Canadians, the economy and industry. Revenues from climate policy should be fully recycled back into the economy to incent innovation, assist transition or reduce other taxes and levies. Technology and innovation should be the focus of policy and capture the opportunity to export solutions to the world. Competitiveness policy must ensure Canadian resources are cost and carbon competitive with other jurisdictions and bring proportional benefits to Canada, including ensuring full value for Canadian energy products through effective access to global markets is received. Competitive policies must be designed to maintain Canada’s ability to raise global investment capital.

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

MEG is an active participant on CAPP working to help shape an effective approach to provincial and federal climate change policy that recognizes and encourages technological innovation in the oil sands.

<table>
<thead>
<tr>
<th>Trade association</th>
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<td></td>
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How have you influenced, or are you attempting to influence their position?

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</table>
Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association’s position
IOSA is an alliance of oil sands developers dedicated to the responsible development of Alberta’s oil sands using in situ technologies. IOSA supports an emphasis on innovation and technology adoption to improve efficiencies, reduce costs and decrease GHG emissions per barrel of production.

How have you influenced, or are you attempting to influence their position?
In 2018 MEG was an active participant on IOSA working to help shape an effective approach to provincial and federal climate change policy that recognizes and encourages technological innovation in the oil sands.

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?
MEG’s engagement with policy makers and trade associations was coordinated internally by the Vice President of Government and Public Affairs for 2018. A multidisciplinary team regularly monitors developments in climate change policy and consolidates that information for the business to ensure that the business interests are protected and that policy trends are understood. To ensure that corporate guidance on activities that influence policy are consistent with MEG’s systematic approach to addressing climate risk across our organization, coordination meetings are held with all departments potentially influenced by the policy to review forthcoming engagement opportunities. In addition, weekly team meetings are held to ensure that messaging is consistent with the corporate direction in all external activities.

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

- ManagementInformationCircular-May-6-2019.pdf
- MEGEnergy2018AIF.pdf
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.

<table>
<thead>
<tr>
<th>Job title</th>
<th>Corresponding job category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief Executive Officer</td>
<td>Chief Executive Officer (CEO)</td>
</tr>
</tbody>
</table>

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

<table>
<thead>
<tr>
<th>I am submitting my response</th>
<th>Public or Non-Public Submission</th>
<th>I am submitting to</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am submitting my response</td>
<td>Public</td>
<td>Investors</td>
</tr>
</tbody>
</table>
I have read and accept the applicable Terms