

## C0. Introduction

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### C0.1

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

General Motors Company ("GM") is a global company committed to delivering safer, better and more sustainable ways for people to get around. With global headquarters in Detroit, Michigan, GM employs 173,000 people in over 400 facilities across six continents.

GM offers a comprehensive range of vehicles and services in more than 120 countries around the world. The largest national market for its products is China, followed by the U.S., Brazil, Canada and Mexico. Along with its strategic partners, GM produces cars and trucks, and sells and services these vehicles through the following brands: Chevrolet and Cadillac globally, and Baojun, Buick, GMC, Holden, Isuzu, Jiefang, and Wuling in certain regions or specific countries.

GM also maintains equity stakes in major joint ventures including SAIC-GM, SAIC-GM-Wuling, FAW-GM in China, and GM Korea, as well as subsidiaries such as OnStar, a recognized industry leader in vehicle safety, security, and information services, and Cruise Automation, a leader in autonomous driving technology.

More information is available at [www.gm.com](http://www.gm.com) and [media.gm.com](http://media.gm.com).

GM's commitment to sustainability applies to every part of our business and creates value for customers. It underscores GM's philosophy of "Customer-Driven Sustainability" – an approach for meeting customers' needs through sustainability by making the mobile experience safer, more efficient, and better integrated with everyday life. As part of that commitment and philosophy, GM continually assesses and takes steps to reduce the environmental impact of its products and operations.

For example, GM is focusing on energy management; carbon and waste intensity reduction; resource preservation; and developing more efficient vehicles through our technological advances, global scale and employee innovation. These areas help the company reduce its environmental footprint and share best practices worldwide for broad results.

Sustainability is also an important part of GM's people and culture. The company integrates sustainability across every business function and through each level of the organization. GM is actively engaged in cross-functional efforts to seize environmental and social opportunities to improve our Company and the communities in which we operate.

GM's Guiding Environmental Commitments, within this document, are the foundation of this policy and were established from the core Environmental Principles and values that were in place for more than 25 years. GM's Guiding Environmental Commitments now serve as a guide for all GM employees worldwide. UNITED NATIONS GLOBAL COMPACT In 2015, GM became a signatory to the United Nations Global Compact, which endorses a framework of principles in the areas of human rights, labor, the environment, and anti-corruption.

GM's commitment supports the Global Compact's ten principles and the company's intent to maintain the principles and to evaluate related global best practices that may be applicable to GM. Of these ten principles, Environment is specifically tied to Principles 7, 8 and 9, which state: • UNGC Principle 7 – Businesses should support a precautionary approach to environmental challenges. • UNGC Principle 8 – Businesses should undertake initiatives to promote greater environmental responsibility. • UNGC Principle 9 – Businesses should encourage the development and diffusion of environmentally friendly technologies. APPLICABILITY This

Environmental Policy applies globally to all of GM's employees and its operations, consultants, agents, sales representatives, distributors, independent contractors, and contract workers when they perform work for GM. GM's Guiding Environmental Commitments encourage environmental consciousness in both daily conduct and in the planning of future products and programs. The Guiding Environmental Commitments support and embrace GM's purpose, values and our vision of a future world with zero crashes, zero emissions and zero congestion. We are committed to actions that restore and preserve the environment. We are dedicated to:

-Preventing deforestation, conserving water, caring for natural resources in and around our facilities and the communities where we operate.

-We believe climate change is real and are committed to the public disclosure of our greenhouse gas emissions and taking actions to reduce them.

-Renewable Energy We are committed to using renewable energy at our facilities and sites globally and will advocate for policies that promote renewable energy use and demand.

General Motors is reporting greenhouse gas emissions (GHG) consistent with GHG Protocol for operations where we have operational control for GHG emissions, owned or leased facilities, and joint ventures as applicable. Our operations are managed regionally in North America, South America, and International Operations (rest of world) and will be reporting Scope 1 and 2 emissions by these regions, as well as company wide.

## C0.2

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

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Row 1	January 1 2018	December 31 2018	Please select	<Not Applicable>

## C0.3

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

- Argentina
- Australia
- Brazil
- Canada
- Chile
- China
- Colombia
- Ecuador
- Egypt
- India
- Mexico
- Republic of Korea
- Russian Federation
- Thailand
- United States of America
- Uzbekistan
- Viet Nam

C0.4

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

USD

C0.5

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**(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-TO0.7/C-TS0.7

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**(C-TO0.7/C-TS0.7) For which transport modes will you be providing data?**

Light Duty Vehicles (LDV)

C1. Governance

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C1.1

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

Yes

C1.1a

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

Position of individual(s)	Please explain
Board-level committee	(i) The Governance and Corporate Responsibility Committee (GCRC) of the GM Board of Directors (ii) is comprised of three independent directors. The Committee selects members of the Board; provides leadership in shaping GM's corporate governance which is important for long-term environmental, social and corporate governance ("ESG") success; and oversees GM's policies and strategies related to Sustainability which is achieved through a standing agenda item for ESG related activities including climate-related updates. The members of this Committee have extensive leadership and strategy experience gained at companies respected for their ESG performance. Their input is valuable as GM further integrates sustainability into its business strategy and addresses climate change on its drive toward a future of zero emissions.

C1.1b

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

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – some meetings	Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Monitoring implementation and performance of objectives Monitoring and overseeing progress against goals and targets for addressing climate-related issues	The Governance and Corporate Responsibility Committee (GCRC) of the Board of Directors of General Motors assists the Board in its oversight of the Company's governance structures, programs, and policies. It brings to the attention of the Board and management, as appropriate, current and emerging global political, social, and policy issues that may affect the business operations, profitability, or public image or reputation of the Company. The GCRC oversees global public policy matters as well as specific functions of the Company, as appropriate, including strategy, action plans, and risk management. Company functions reviewed by the GCRC include Legal, Global Public Policy, and Sustainability, including climate change, corporate social responsibility, and philanthropic activities. GCRC receives regular reports from the Strategic Risk Management (SRM) team, led by an executive director with dedicated resources, has risk management responsibility and is supported by the Risk Advisory Council (RAC)—executives who directly report to the Executive Leadership Team (ELT).

**C1.2**

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

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Other C-Suite Officer, please specify (Executive Vice President of Global Manufacturing)	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly

**C1.2a**

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

GM envisions a world with zero crashes, to save lives; zero emissions, so future generations can inherit a healthier planet; and zero congestion, so customers get back a precious commodity -- time.

GM is focused on strengthening its core business of light-duty vehicles, while also working to lead the transformation of personal mobility through advanced technologies like connectivity, electrification, autonomous driving, and car sharing. GM has also established a strategic direction based on putting the customer at the center of everything the Company does and GM's customers expect GM to help mitigate, if not eliminate, issues such as congestion and emissions.

GM's operations greenhouse gas (GHG) emissions are about 85% of the total; therefore, GM's Executive Vice President of Global Manufacturing who reports to the CEO and is on the Senior Leadership team (SLT) along with the CEO is key to GM's response to climate related issues. The Board of Directors is briefed annually on Environmental issues through interaction with the GCRC. The GCRC and SLT are linked to a Sustainability Team (ST) and has daily functional leads in GM Public Policy Group. The ST solicits feedback from Internal and External advisory groups related to Climate Change issues.

The SLT and Executive Vice President of Global Manufacturing receives regular updates and is involved in key decisions that further our long-term strategic objectives including our efforts to reduce GHG emissions toward a future of zero emissions. As an example, GM's new goal for absolute GHG reduction for operations or 31% from 2010 to 2030 was developed by GM's Sustainable Workplaces team and reviewed by the Executive Vice President of Global Manufacturing and approved. On a monthly basis GM's performance to its public energy and water goals, which are climate change related, are reviewed by the Manufacturing Leadership Team, led by the Executive VP of Global Manufacturing. If targets are not on the pathway, countermeasures are developed at the plant level and reviewed by the MLT. An example of a countermeasure was increased attention to shutdown energy as severe climate caused our pathway to exceed our target in the early months of 2018. With attention to shutdown energy and increase in Energy Treasure Hunts, we were able to turn green by mid-year.

The Risk Committee of the Board (GCRC) that is linked to SLT and ST is responsible for overseeing GM's management of enterprise-level risks. The Strategic Risk Management (SRM) team, led by an executive director with dedicated resources, has risk management responsibility and is supported by the Risk Advisory Council (RAC)—executives who directly report to the SLT. A global network of executives representing GM's key functions and markets are given additional responsibilities as risk officers to support the overall SRM program and process. GM's risk and opportunities identification process is as follows:

- RAC and Risk officers appointed

- Annual identification, evaluation, and assessment of Company and asset risks and opportunities.

- Ongoing mitigation plan development and monitoring by RAC and Risk Officers and approval by the SLT.

(i) Risks and opportunities are categorized based on frequency, velocity, and impact on financials, operations, reputation, etc.

- All top risks have approved mitigation plans, and are reviewed regularly by the SLT and the Board.

- All other risks have either an approved mitigation plans and are reviewed at least once a year by the SLT, or, after being fully analyzed, are put on a "watch list" and are monitored by the risk officer and their respective ELT member.

(ii) Asset level risks have mitigation plans that are the responsibility of local management. Exposure to and experience with catastrophic risk or losses from climate change or other natural events are continuously analyzed and reviewed for ongoing operations and when evaluating new sites and selecting suppliers. Asset level risks are generally those that are anticipated to occur with regular or high frequency, but have a low impact on the Company and can be managed locally. Lessons learned are incorporated into future site planning, supplier selection process, and risk mitigation and strategic development. For Manufacturing, each site has a Plant director (PD) that has profit and loss responsibility for operations. PD often need support for asset level risk and rely on the Manufacturing Leadership Team (MLT), comprised of the Executive VP for Global Manufacturing, regional VPs of Manufacturing, the VP of Sustainable Workplaces, Manufacturing representative on RAC, and other resources for risk management and action planning and implementation. The MLT has subject matter experts in risk management and sustainability as resources to PD for risk management.

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## C1.3

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

Yes

**C1.3a**

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

**Who is entitled to benefit from these incentives?**

Corporate executive team

**Types of incentives**

Monetary reward

**Activity incentivized**

Emissions reduction target

**Comment**

GM introduced its vision of a future with zero crashes, zero emissions, and zero congestion in 2017. In a related action, GM updated its executive compensation program in 2017 to continue its leaders' focus on the key areas that both drive the business forward and align to the short-term and long-term interests of our shareholders. Accordingly, GM's Short-term Incentive Plan was modified to include an individual performance component weighted at 25%, including results that had a positive impact on Environmental, Social, and Governance (ESG) measures. For example, as highlighted in GM's 2018 Proxy statement, GM CEO's compensation was evaluated against GM's 2017 strategic objectives and included the introduction of GM's vision of zero crashes, zero emissions, and zero congestion, and expanding car-sharing capabilities. In January, we announced that Cadillac will be General Motors' lead EV brand when we launch our next generation, battery-electric vehicle architecture. This global architecture will be flexible and versatile, allowing us to build everything in our portfolio from just three drive units. Another example in our operations is that our Business Unit managers and Plant Directors, must meet certain Energy targets for their respective facilities as one of their goals that relates to their individual compensation. Individual performance is based on GM's "Commitment and Accountability Partnership" or CAP system for performance evaluation and compensation. CAP goals are set at the beginning of the year and reviewed every 6 months for performance.

**C2. Risks and opportunities**

**C2.1**

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

	From (years)	To (years)	Comment
Short-term	1	3	Short term plans include annual budgets for Capex and Opex.
Medium-term	3	5	GM's Mid term plan includes 3-5 years of budgets for resources and funds.
Long-term	5		Long term is open-ended and is extended based on the type of risk or opportunity. As an example, GM's RE-100 commitment extends to 2050.

**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	One of the most significant risks likely to impact GM are regulatory risks. Due to the potentially catastrophic effects of climate change, governments around the world have enacted or are likely to enact policies and regulations that could impact our operations and products. Because it may take 3-5 years to design and develop a vehicle before it is launched in the market and then remain competitive and compliant for another 4-7 years, GM uses a long-term approach to regulatory risks. Environmental issues, including Climate Change are a regular agenda item on the Governance and Corporate Responsibility Committee at the Board level.

## C2.2b

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

GM's Executive Director of Strategic Risk Management (SRM), is fully dedicated to risk management at GM and supports executive leadership, including our Chairman and CEO who is also the Chief Risk Officer, as well as GM's Board and Risk Committee. The Risk Committee of the Board is responsible for overseeing the Company's management of enterprise-level risks, including climate-related risks such as climate-related policies and regulations that can impact our products, services, and operations, along with the Strategic Risk Management (SRM) program and processes. This executive director leads the SRM team and is supported by the Risk Advisory Council (RAC)—executives who directly report to the Senior Leadership Team (SLT), including the CEO and direct reports. A global network of executives representing GM's key functions and markets are given additional responsibilities as Risk Officers to support the overall SRM program and process. GM's risk and opportunities identification process is as follows: - RAC and Risk officers appointed; Annual identification, evaluation, and assessment of Company and asset risks and opportunities conducted; Ongoing mitigation plan development and monitoring by RAC and Risk Officers and approval by the SLT.

- Asset level risks have mitigation plans that are the responsibility of local management. Exposure to and experience with catastrophic risk or losses from climate change or other natural events are continuously analyzed and reviewed for ongoing operations and when evaluating new sites and selecting suppliers. Asset level risks are generally those that are anticipated to occur with regular or high frequency, but have a low impact on the Company and can be managed locally. Lessons learned are incorporated into future site planning, supplier selection process, and risk mitigation, and strategic development.

- The process and terminology in place for assessing relative significance of all identified risks, including climate-related risks such increased and more stringent GHG emission regulations, is as follows: (i) Risks and opportunities are categorized based on frequency, velocity, and impact on financials, operations, reputation, etc. - All top risks have approved mitigation plans and are reviewed regularly by the SLT and the Board. - All other risks have either approved mitigation plans and are reviewed at least once a year by the SLT, or after being fully analyzed, are put on a "watch list" and are monitored by the risk officer and their respective SLT member.

- GM assesses risks based on management's professional judgment, the relevant case law, definitions and guidance from the U.S. Securities and Exchange Commission (the "SEC") and discussions with external auditors. This includes both a quantitative and qualitative assessment. From a quantitative perspective, GM considers the risk as a percentage of various financial statement amounts (e.g., assets, liabilities, revenues, earnings, etc.). From a qualitative perspective, GM considers all of the relevant circumstances including whether the risk is strategically integral or important to the Company's business plan, whether the risk will have an impact on future results of operations or financial condition, and whether the risk is important to an understanding of the company's business. As a result, risks that we have identified as having a substantive impact will vary from risk to risk in terms of quantitative and qualitative perspectives.

## C2.2c

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

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Our products are subject to extensive laws, governmental regulations and government policies that can significantly increase our costs and affect how we do business. We are significantly affected by governmental regulations that can increase costs related to the production of our vehicles and affect our product portfolio. Meeting or exceeding many of these regulations is costly and often technologically challenging with respect to mandated emissions and fuel economy standards, especially where standards may not be harmonized across jurisdictions. Driven by climate change and other related factors such as air quality and energy security, GHG and fuel consumption standards have become more stringent to meet government policy priorities. We anticipate that the number and stringency of these regulations, and the related costs and changes to our product portfolio, may increase significantly in the future. These government regulatory requirements could significantly affect our plans for global product development, and given the uncertainty surrounding enforcement and regulatory definitions, may result in substantial costs, including civil or criminal penalties. In addition, an evolving but un-harmonized regulatory framework may limit or dictate the types of vehicles we sell and where we sell them, which can affect revenue. The Board has the overall responsibility for risk oversight with a focus on the most significant risks facing the company such as current regulations related to GM's business. While GM does not follow the precautionary approach, it does have a comprehensive risk management plan in place. Effective risk management is the responsibility of the CEO and other members of management, including the senior leadership team (SLT). Our Board implements its risk oversight function both as a whole and through delegation to Board Committees, particularly the Risk Committee for current regulations. Each of the Board Committees is responsible for oversight of risk management practices for categories of risks relevant to its functions.
Emerging regulation	Relevant, always included	We see autonomous technology leading towards a future of zero congestion, zero emissions and zero crashes, since, according to the National Highway Traffic Safety Administration (NHTSA), more than 90% of crashes are caused by driver error. We are among the leaders in the industry with significant global real-world experience in delivering connectivity, safety, and security services to millions of customers through OnStar, LLC (OnStar) and advanced safety features that are the building blocks to more advanced automation features that are driving our leadership position in the development of autonomous technology. An example of advanced automation is Super Cruise, a hands-free driving customer convenience feature that is available on the 2018 Cadillac CT6 sedan. We are actively testing autonomous vehicles on public roads in San Francisco, California; Scottsdale, Arizona; and Warren, Michigan. In November 2017 we announced that our growing fleet of test vehicles will accumulate a significant number of miles in 2018, and as of April 1, 2019, Maven electric miles driven are 47 Million miles, avoiding 1.8 Million gallons of gasoline use with EVs. Many of our advanced technologies, including autonomous, present novel issues with which domestic and foreign regulators have only limited experience and will be subject to emerging regulation and evolving regulatory frameworks. Any current or future regulations in these areas could impact whether and how these technologies are designed and integrated into our products, and may ultimately subject us to increased costs and uncertainty. The Board has the overall responsibility for risk oversight with a focus on the most significant risks facing the company such as emerging regulations related to GM's business. While GM does not follow the precautionary approach, it does have a comprehensive risk management plan in place. Effective risk management is the responsibility of the CEO and other members of management, including the senior leadership team (SLT). Our Board implements its risk oversight function both as a whole and through delegation to Board Committees, particularly the Risk Committee for emerging regulations. Each of the Board Committees is responsible for oversight of risk management practices for categories of risks relevant to its functions.
Technology	Relevant, always included	Technology in our products and facilities is included in Climate Change risk assessments on a case by case basis. An example workshop, sponsored by GM's corporate secretary and the head of GM's product portfolio planning, and led by Strategic Risk Management and Sustainability organizations — brought together a broad, cross-functional team, from public policy to global propulsion systems to business intelligence. Goals included developing and understanding a range of different world scenarios; identifying risks, opportunities and success factors for GM; and making recommendations for GM to analyze, prepare, adapt and act. The Climate Workshop (Scenario Analysis) used a 2 degree scenario. The time frame of the analysis was out to 2030. The inputs for the analysis included a number of trends and forecasts such as vehicle sales, technology and innovation, policies and regulations, energy, consumer behaviors, etc. One of the key findings is that the world on a 2 degree C path has implications for key drivers of GM's technology that include vehicle fuel efficiency, vehicle-to-vehicle/customer/infrastructure connectivity, and advance vehicle technology.
Legal	Relevant, always included	In the current uncertain regulatory framework, environmental liabilities for which we may be responsible and that are not reasonably estimable could be substantial. Alleged violations of safety or emissions standards could result in legal proceedings, the recall of one or more of our products, negotiated remedial actions, fines, restricted product offerings, or a combination of any of those items. Any of these actions could have substantial adverse effects on our operations including facility idling, reduced employment, increased costs, and loss of revenue. There are several putative class actions pending against GM in federal courts in the U.S. and in the Provincial Courts in Canada alleging that various vehicles sold including model year 2011-2016 Duramax Diesel Chevrolet Silverado and GMC Sierra vehicles, violate federal and state emission standards. GM also faces a series of additional lawsuits based primarily on allegations in the Duramax suit, including putative shareholder class actions claiming violations of federal securities law. The securities and shareholder demand lawsuits have been voluntarily stayed by the plaintiffs. At this stage of these proceedings, we are unable to provide an evaluation of the likelihood that a loss will be incurred or an estimate of the amounts or range of possible loss. The Board has the overall responsibility for risk oversight with a focus on the most significant risks facing the company such as legal risks related to GM's business. While GM does not follow the precautionary approach, it does have a comprehensive risk management plan in place. Effective risk management is the responsibility of the CEO and other members of management, including the senior leadership team (SLT). Our Board implements its risk oversight function both as a whole and through delegation to Board Committees, particularly the Risk Committee for emerging regulations. Each of the Board Committees is responsible for oversight of risk management practices for categories of risks relevant to its functions. GM Legal team, led by an Executive VP & General Counsel ensure that legal risks are managed at the business unit level.
Market	Relevant, sometimes included	Marketing of our products is included in Climate Change risk assessments on a case by case basis. An example workshop, sponsored by GM's corporate secretary and the head of GM's product portfolio planning, and led by Strategic Risk Management and Sustainability organizations — brought together a broad, cross-functional team, from public policy to global propulsion systems to business intelligence. Goals included developing and understanding a range of different world scenarios; identifying risks, opportunities and success factors for GM; and making recommendations for GM to analyze, prepare, adapt and act. The Climate Workshop (Scenario Analysis) used a 2-degree scenario. The time frame of the analysis was out to 2030. The inputs for the analysis included several trends and forecasts such as vehicle sales, technology and innovation, policies and regulations, energy, consumer behaviors, etc. One of the key findings is that the world on a 2-degree C path has implications for key drivers of GM's marketing related to vehicle fuel efficiency, vehicle-to-vehicle/customer/infrastructure connectivity, and advance vehicle technology.

	Relevance & inclusion	Please explain
Reputation	Relevant, always included	The costs and effect on our reputation of product safety recalls and alleged defects in products and services could materially adversely affect our business. Government safety standards require manufacturers to remedy certain product safety defects through recall campaigns. Under these standards, we could be subject to civil or criminal penalties or may incur various costs, including significant costs for free repairs. At present, the costs we incur in connection with these recalls typically include the cost of the part being replaced and labor to remove and replace the defective part. The costs to complete a recall or customer satisfaction action could be exacerbated to the extent that such actions relate to a global platform. Concerns about the safety of our products, including advanced technologies like autonomous, whether raised internally or by regulators or consumer advocates, and whether or not based on scientific evidence, can result in product delays, recalls, lost sales, governmental investigations, regulatory action, private claims, lawsuits and settlements, and reputational damage. These circumstances can also result in damage to brand image, brand equity, and consumer trust in the Company's products and ability to lead the disruption occurring in the automotive industry. We currently source a variety of systems, components, raw materials and parts, including but not limited to air bag inflators, from third parties. From time to time these items may have performance, quality, or reputational issues that could harm our reputation and cause us to incur significant costs. For example, we are currently conducting recalls for certain Takata air bag inflators used in some of our prior model year vehicles. Further recalls, if any, that may be required to remediate Takata air bag inflators in our vehicles could have a material impact on our business. The Board has the overall responsibility for risk oversight with a focus on the most significant risks facing the company such as reputational risk related to GM's business as described above. While GM does not follow the precautionary approach, it does have a comprehensive risk management plan in place. Effective risk management is the responsibility of the CEO and other members of management, including the senior leadership team (SLT).
Acute physical	Relevant, sometimes included	Acute physical considerations of climate change in our facilities are included in risk assessments on a case by case basis. An example is at water stressed sites, like San Luis Potosi Assembly plant in Mexico, where GM Manufacturing, led by our Executive VP of Global Manufacturing, performed a risk assessment of water scarcity and elected to install Zero Liquid Discharge equipment and operate it to mitigate the risk. The Manufacturing Leadership Team at GM manages mitigation of acute physical risks associated with facilities described above. If material to the business, the Executive Vice President of Global Manufacturing, also a member of the SLT would work with the Board Risk Committee for assistance.
Chronic physical	Relevant, sometimes included	Chronic physical considerations from climate change in our facilities are included in risk assessments on a case by case basis. An example is at our Detroit Hamtramck Assembly plant where a risk assessment was done based on the high cost of storm water discharge from flooding events. Working with the City of Detroit, we installed larger storm ponds and filtration equipment to reuse the stormwater in cooling towers and process. The Manufacturing Leadership Team at GM manages mitigation of Chronic physical risks associated with facilities described above. If material to the business, the Executive Vice President of Global Manufacturing, also a member of the SLT would work with the Board Risk Committee for assistance.
Upstream	Relevant, sometimes included	Upstream considerations in our direct and indirect operations are included in risk assessments on a case by case basis. Our upstream logistics operations had increased cost and carbon emission risk that drove efforts to reduce cost and GHG emissions in 2018. Based on the significant cost and GHG risk in logistics, GM evaluated mitigation using SmartWay in North America to track emissions and share best practices with carriers and third party logistic companies, using internal company methods to analyze logistics operations and develop and implement cost and carbon savings initiatives. An Executive Director of GM's Global Purchasing and Supply Chain Strategy, Planning & Operations is responsible to assess risks and mitigate them related to upstream parts supplies.
Downstream	Relevant, sometimes included	An example workshop, sponsored by GM's corporate secretary and the head of GM's product portfolio planning, and led by Strategic Risk Management and Sustainability organizations — brought together a broad, cross-functional team, from public policy to global propulsion systems to business intelligence. Goals included developing and understanding a range of different world scenarios; identifying risks, opportunities and success factors for GM; and making recommendations for GM to analyze, prepare, adapt and act. The Climate Workshop (Scenario Analysis) used a 2 degree scenario. The time frame of the analysis was out to 2030. The inputs for the analysis included a number of trends and forecasts such as vehicle sales, technology and innovation, policies and regulations, energy, consumer behaviors, etc. One of the key findings is that the world on a 2 degree C path has implications for key drivers of GM's downstream risk related to the use of GM's sold vehicles and Climate Change. The Board has the overall responsibility for risk oversight with a focus on the most significant risks facing the company such as downstream use of sold vehicles and climate change risk related to GM's business as described above. While GM does not follow the precautionary approach, it does have a comprehensive risk management plan in place. Effective risk management is the responsibility of the CEO and other members of management, including the senior leadership team (SLT).

## C2.2d

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

The Strategic Risk Management process views risks as new opportunities and therefore, our process takes this into account. All risks and opportunities, including climate-related risks and opportunities, are prioritized based on frequency of occurrence, how quickly they may materialize, and their potential impact to the Company. Impact may be measured by a number of variables including reputational, operational, financial, etc. Risk management tools employed to help with decision making and mitigation plan development include War-games, Game Theory, and Scenario Planning. For example, the 2 degrees climate scenarios workshop that the SRM team conducted not only focused on future risks, but also resulted in future new business opportunities.

With regard to climate change, risks and opportunities vary from government regulations to supply chain disruption. These are prioritized differently based on frequency of occurrence, time to respond, and impact. For example, government regulations such as

new fuel economy/CO2 tailpipe emissions are occurring at a high frequency, but the time to respond is generally adequate to execute mitigation plans that minimize the impact to the Company.

Company level Risks and opportunities are categorized as Tier 1, 2, or 3 based on frequency, how quickly they may materialize, and their potential impact to the Company. Impact may be measured by variables including reputational, operational, revenue, etc.

- All Tier 1 risks and opportunities have approved plans for mitigation and/or business development and are reviewed in detail regularly by the SLT and by the Board.

- All Tier 2 risks and opportunities have approved mitigation plans and are reviewed at least once a year by the SLT and by the BOD.

- All Tier 3 risks and opportunities have been fully analyzed, put on a "watch list," and are regularly reviewed by the risk officer and their respective SLT member.

In the short term (0-5 years), GM is responding to climate change in multiple ways. A case study example of risk management follows: In order for GM operations to **reduce physical risk of rising energy prices and take advantage of the opportunity to reduce cost**, GM has set aggressive energy and GHG intensity reduction targets through 2020. The internal process used is to integrate energy reduction into our business plan. Annually, we develop energy and GHG reduction targets at a global, regional, and facility level and include methods in our annual business planning process which GM calls its Business Plan Deployment (BPD). These methods include behavioral - cold shutdown, energy efficiency - LED lights, HVAC controls, and low carbon solutions - for example, use of landfill gas to generate electricity. An example of how this process has influenced the business strategy is the development and use of energy performance contracting to fund the energy and carbon reduction methods. In 2018, energy and carbon reduction projects resulted in 4% carbon reduction on an absolute basis. GM exceeded its 2020 operations carbon reduction goal with 22% on an intensity basis since 2010 and an absolute reduction even though vehicle volume increased by 27%. We announced a new goal from 2010 to 2030 with an absolute GHG reduction in our scopes 1 & 2 of 31% based on science to reduce global temperature rise to 2050 by 2 C.

GM's global risk management process includes climate change issues, such as policy/regulatory changes and changing consumer behaviors that are discussed with our Board of Directors, Executive Operations Committee (highest management committee), Corporate Strategy Committee, and the Product Development Committee.

An example of how GM is managing transitional risk, to achieve our long term (>5 years) carbon reduction plans is focus on our total carbon footprint, including use of sold products (vehicles). For our vehicles we have established carbon reduction goals and we have made a commitment to launch additional electric vehicles. Annually, we track our progress to these goals using market sales and measured vehicle emission factors provided by our Public Policy Group. To ensure that we meet these goals on a long-term basis, in 2018 we invested \$7.8 B in research and development activities. This includes strategic planning to develop affordable products that incorporate technologies that improve vehicle safety, displace petroleum with biofuels and electricity, increase fuel efficiency, reduce emissions, and provide additional value and benefits to our customers. In keeping with this strategy, we remain committed to bringing more electrified and fuel-efficient options to market. Bringing EV products to market represents mitigation of climate change risk. In 2018, we introduced two new all-electric vehicles in China, based on what we have learned from developing the Chevrolet Bolt EV: the Buick Velite 6 EV and the Baojun E200. China is the world's largest EV market, and a major driver of EV adoption.

## C2.3

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

**Identifier**

Risk 1

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

Customer

**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**

<Not Applicable>

**Company- specific description**

CARB's latest requirements include increasing ZEVs offered for sale in CA and ZEV volumes for 2018 model year and later. Quebec adopted ZEV requirements starting with 2018 model year; other jurisdictions may follow. The Clean Air Act permits states with air quality compliance issues to adopt CA emission standards in lieu of federal requirements; 13 states use these standards, 10 of which have adopted ZEV requirements. GM's cost profile is private, but a third-party cost examination of the Chevy Bolt estimates GM loses \$7,400 per Bolt EV sold. We intend to mitigate this risk by launching new profitable EVs in the future and are working to reduce near-term total enterprise costs associated with the Bolt EV.

**Time horizon**

Medium-term

**Likelihood**

Likely

**Magnitude of impact**

Medium-high

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

Yes, a single figure estimate

**Potential financial impact figure (currency)**

23000000

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

<Not Applicable>

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

<Not Applicable>

**Explanation of financial impact figure**

GM's cost profile is private, but a third-party cost examination of the Chevy Bolt estimates GM loses \$7,400 per Bolt EV sold. In 2018, GM produced 30,615 Bolt EVs (0.4% of annual sales). As an estimate, if ZEV mandates require GM to produce an additional 10% of EVs, it would amount to an additional 3,062 units or \$7,400 times 3,062 = \$23M.

**Management method**

On a long-term basis, we intend to mitigate this risk by launching 20 new profitable EVs by 2023. We currently offer seven models in the U.S. featuring some form of electrification and continue to develop plug-in hybrid electric vehicle technology and extended range electric vehicles such as the Chevrolet Volt and Bolt EV. We announced our plans to launch multiple new Zero Emission Vehicles (ZEVs) in global markets by 2023, including two in the next 18 months. In the short term we are working to increase battery electric vehicle production at our Orion Assembly in 2017-8 and a significant expansion of our battery lab in Warren, MI, already one of the largest in the world, brings the facility to more than 100,000 sq. ft. that includes new heavy and mild battery abuse test areas. GM's current amount of research and development cost is \$7.8 Billion. The continued development of our EV portfolio rests upon 20 years of electrification knowledge and experience and the investment of billions in research and development.

**Cost of management**

7800000000

## Comment

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### Identifier

Risk 2

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

Customer

### 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

Increases in the frequency of drought conditions can further depress water availability for production in water-stressed areas. GM has production facilities in Mexico, an area that was hit hard by drought in recent years, and there is a risk that increases in the frequency of such events could disrupt production due to lack of water availability. Mexico accounts for approximately 7% of GM's global production.

### Time horizon

Short-term

### Likelihood

About as likely as not

### Magnitude of impact

Medium-high

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

Yes, a single figure estimate

### Potential financial impact figure (currency)

842000000

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

<Not Applicable>

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

<Not Applicable>

### Explanation of financial impact figure

Mexico accounts for approximately 7% of GM's global production. 7% of GM's sales and revenues = \$10.1 billion and a one month disruption due to water scarcity would = \$842,000,000.

### Management method

GM integrated water management into its annual business planning process and set targets for each facility to reduce water use intensity by 15% by 2020. Reduction methods are implemented at a facility level and include conservation with behavioral activities, improving equipment efficiency to reduce, and reuse. When plants are located in water-stressed areas, special consideration is given to water treatment technologies. A Zero Liquid Discharge (ZLD) system was installed at our San Luis Potosi, Mexico facility that produces vehicles and transmissions and is being operated to reuse water in the process, reduce withdrawal from deep wells, and reduce the risk of lack of water for production while providing an opportunity to continue production without interruption. The installed cost was \$12M and ongoing operations are \$200k. Additionally, at our Silao plant in Mexico we are currently expanding the volume of reuse with an \$8M dollar investment.

### Cost of management

20200000

## Comment

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### Identifier

Risk 3

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

Customer

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**Risk type**

Transition risk

**Primary climate-related risk driver**

Market: Changing customer behavior

**Type of financial impact**

<Not Applicable>

**Company- specific description**

Changing consumer behavior could weaken the demand for our higher margin full-size pick-up trucks and sport utility vehicles, such as Silverado, Sierra, Suburban, and Tahoe, which could reduce our market share in affected markets, decrease profitability, and have a material adverse effect on our business if we are unable to offer alternatives that are of interest to our customers. (i) Volatility in fuel pricing and tax incentives may affect consumer behavior. As of 2018, carbon-pricing schemes are operating in at least 33 countries and 18 sub-national jurisdictions, covering around 20 percent of global emissions. Though CO2 pricing schemes vary widely around the world, all are intended to encourage consumers to purchase vehicles that emit less carbon or, at a minimum, to help raise public awareness about the importance of CO2 reduction. Carbon Trading Schemes are active in South Korea where GM Korea operates and China where GM China sales are the highest of any country for GM. (ii) There is a risk that there may be less demand for GM's larger, less fuel efficient vehicles, such as Chevrolet Suburban. Changing consumer behavior could weaken the demand for our higher margin full-size pick-up trucks and sport utility vehicles, which could reduce our market share in affected markets, decrease profitability, and have a material adverse effect on our business if we are unable to offer alternatives that are of interest to our customers.

**Time horizon**

Medium-term

**Likelihood**

More likely than not

**Magnitude of impact**

Medium

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

Yes, a single figure estimate

**Potential financial impact figure (currency)**

118000000

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

<Not Applicable>

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

<Not Applicable>

**Explanation of financial impact figure**

On a global basis, a decrease in sales due to changing consumer behavior of 1% for example may result in a decrease in earnings before interest and taxes adjusted of \$118 million USD

**Management method**

Continuous innovation and advanced technology development are key to keeping up with changing consumer behavior. One way GM achieves this is through our global network of R&D labs around the world as well as through active collaboration with academia, suppliers, and start-ups to develop new technologies centered on five strategic areas: 1. Automotive Cleantech that improves fuel economy and decreases mobile emissions through advanced engine and transmission technology, next-generation batteries and electric motors, and power electronics; 2. Connected Vehicles that leverage data, enhance vehicle safety; 3. Advanced Materials that lead to more fuel-efficient vehicles through reduced mass; and Sensors, Processors and Memory that can accelerate the advent of the autonomous vehicle; 4. Manufacturing Technologies that yield cost and quality improvements. In 2018 we offered the Chevrolet Bolt, a battery electric vehicle and we plan to continue to invest heavily to support the expansion of our electric vehicle offerings and in-house development and manufacturing capabilities of advanced batteries, electric motors and power control systems. In 2018, GM invested approximately \$7.8 billion in R&D activities for vehicles. Additionally, we have removed an average of 350 pounds from new-vehicle launches, compared to the previous. This has reduced CO2 by about 312,000 tons per year, and demonstrates that strides toward zero emissions can also come from our traditional products.

**Cost of management**

7800000000

**Comment**

## C2.4

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### (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

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### (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?

Customer

#### Opportunity type

Products and services

#### Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

#### Type of financial impact

Increased revenue through demand for lower emissions products and services

#### Company-specific description

Autonomous electric vehicles offer GM a significant business opportunity to combat climate change. AV systems integrate more seamlessly with EVs than vehicles with conventional internal combustion engines. All-electric AVs also will help accelerate more widespread adoption of electric propulsion technologies. We see autonomous technology leading toward a future of zero congestion, zero emissions and zero crashes, since, according to the National Highway Traffic Safety Administration (NHTSA), more than 90% of crashes are caused by driver error. When it comes to developing and deploying self-driving vehicles, General Motors and its Cruise AV subsidiary are in a unique leadership position, with everything from design, engineering, validation and testing all under one roof. We believe this seamless integration is the safest way to develop autonomous vehicles, and with help from investments from the SoftBank Vision Fund (\$2.25 billion), Honda (\$2.75 billion), and most recently, funds advised by T. Rowe Price and existing Cruise partners, (\$1.15 billion), we will strengthen our commercialization plans.

#### Time horizon

Short-term

#### Likelihood

Likely

#### Magnitude of impact

Medium-high

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

Yes, a single figure estimate

#### Potential financial impact figure (currency)

6100000000

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

<Not Applicable>

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

<Not Applicable>

#### Explanation of financial impact figure

Assuming AV is a trillion-dollar global market based upon third party sources and GM's global market share is 10.2%, we calculated our financial opportunity within the AV market as \$100B. Today, the market is approximately \$5B. We do not publicly report on the financial positive implications at this time, but we did publicly report that the SoftBank Vision Fund (\$2.25 billion), Honda (\$2.75 billion), and most recently, funds advised by T. Rowe Price and existing Cruise partners, (\$1.15 billion) in Cruise, which we are including as our financial positive implications for this year.

### Strategy to realize opportunity

We are actively testing autonomous vehicles on public roads in San Francisco, California; Scottsdale, Arizona; and Warren, Michigan. Additionally, we plan to develop an integrated network of on-demand autonomous vehicles in the U.S. We are growing a fleet of test vehicles that have accumulated a significant number of miles in 2018 and based on our current rate of change we expect commercial launch at scale in dense urban environments in 2019. GM's Investment for Cruise has been \$1.1B. Technologies such as Cadillac's hands-free driver assistance system, Super Cruise, are stepping stones to fully autonomous vehicles. This year we are expanding the functionality of Super Cruise and adding another 70,000 miles of compatible divided highways in the U.S. and Canada, making this technology available on more than 200,000 miles of highways. Self-driving vehicles are one way to disrupt the traditional ownership model; sharing is another. Through Maven, our on-demand shared mobility platform, we have learned a great deal about how urban customers use shared mobility. Our newest offering, peer-to-peer car sharing, allows owners of General Motors vehicles to earn money by listing their personal vehicle for Maven members to use.

### Cost to realize opportunity

1100000000

### Comment

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#### Identifier

Opp2

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

Direct operations

#### Opportunity type

Resource efficiency

#### Primary climate-related opportunity driver

Move to more efficient buildings

#### Type of financial impact

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

#### Company-specific description

Energy Efficiency projects implemented in our manufacturing operations in South Korea resulted in the opportunity to sell carbon credits into the Emission Trading Scheme in South Korea. Implementing energy efficiency in GM operations in Korea began with an Energy Treasure Hunt in early 2017 and ended with the implementation of various initiatives - LED lights, compressed air, and building management system improvements. These initiatives represent an opportunity for us to reduce our operational costs and to sell carbon credits into the Korean Carbon Emission Trading Scheme. In 2018, GM Korea continued to make efficiency improvements and sold 464,884 tons at \$20.44 for a revenue of \$9.5M USD

#### Time horizon

Current

#### Likelihood

Virtually certain

#### 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)

9500000

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

<Not Applicable>

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

<Not Applicable>

#### Explanation of financial impact figure

Cost savings resulting from reduced use of electricity and natural gas in GM Korea operations from the implementation of energy conservation and efficiency measures - LED lights, compressed air and building management, and other efficiency projects. Additionally, in 2018 we sold \$9.5M from trading carbon credits into the ETS, partially because of implementing energy conservation measures. We are using the direct sale of CO2e credits as a financial benefit in 2018 from energy efficiency.

#### Strategy to realize opportunity

GM identifies energy and carbon savings opportunities using a standardized Energy Treasure Hunt process as documented by

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USEPA Energy Star. The opportunities include paint shop optimization, HVAC improvements, lighting, building envelope improvements, and controls. Action plans were developed to implement energy conservation measure opportunities and were implemented to provide cost savings and reduction of carbon emissions at GM's Bupyeong, South Korea site that manufactures vehicles and parts. The process utilized our Operational Excellence process to track progress and measure success. The cost to implement energy conservation measures was \$1.3M. In 2018, we also conducted multiple Energy and Water treasure hunts in many countries - US, MX, India, Thailand, China, and Brazil in 2018.

**Cost to realize opportunity**

1313000

**Comment**

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**Identifier**

Opp3

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

Direct operations

**Opportunity type**

Resource efficiency

**Primary climate-related opportunity driver**

Reduced water usage and consumption

**Type of financial impact**

Increased production capacity, resulting in increased revenues

**Company-specific description**

As extreme drought conditions occur, GM facilities in Mexico that have water reuse systems are resilient and can continue to operate. Increases in the frequency of drought conditions can cause disruptions to GM production in our highest water use and production critical process of painting vehicles, due to water stress. Proper mitigation using water conservation and water reuse allows production to continue without added water stress on local water systems. GM's water management approach at production facilities located in water stressed areas offers an opportunity to continue production without disruptions due to lack of water for people and critical paint shop production. In our San Luis Potosi Assembly plant in Mexico, GM uses a Zero Liquid Discharge system to minimize the reliance on well water withdrawal.

**Time horizon**

Current

**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)**

69000000

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

<Not Applicable>

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

<Not Applicable>

**Explanation of financial impact figure**

Mexico accounts for about 7% of total global production and a one-month disruption of GM's production could result in loss of \$69 Million in net income (EBITA); the opportunity to GM is the continuance of production avoiding a potential loss of \$69 Million USD.

**Strategy to realize opportunity**

Plants located in water-stressed areas, such as Mexico, are given special consideration by GM for water treatment technologies. Minimizing water use and withdrawals from shared water sources allows the GM plant to minimize the stress it is placing on local water sources, which in turn helps lessen the risk that, in times of drought, local water sources will have been depleted beyond capacity potentially causing production disruption. The invested amount for ZLD was \$12M and \$7M at Silao with ongoing operations cost of \$200k/year An example of the engineering method used is in our San Luis Potosi plant, where a closed loop water system (Zero Liquid Discharge) was engineered to reuse 90% of the facility's wastewater for the next cycle of plant operations and the remaining 10% is sent to an onsite pond where it evaporates. The plant has reduced its water withdrawals by

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90% by reusing wastewater. The plant also reduced its water intensity by 10% since opening using BPD management methods and remains our best operating plant for water efficiency.

### Cost to realize opportunity

19200000

### Comment

## C2.5

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

	Impact	Description
Products and services	Impacted for some suppliers, facilities, or product lines	Driven by climate change and other related factors such as air quality and energy security, risks to our business such as GHG and fuel consumption standards have become more stringent to meet policy priorities. These government regulatory requirements could significantly affect our plans for global product development and may result in substantial costs, including civil or criminal penalties. In addition, an evolving but un-harmonized regulatory framework may limit or dictate the types of vehicles we sell and where we sell them, which can affect revenue. Opportunities include the planned launch of new EVs and we are working to reduce production costs associated with EVs. As an example, in March 2019, we announced a \$300 million investment in our Orion Township, Michigan assembly plant to produce a new Chevrolet electric vehicle. The development of new technologies affects all aspects of our business from vehicle development, to supply chain, marketing, and operations. The investment is 3.5% of our total capital spend in 2018 and represents a medium impact. Depending on market conditions for EVs, it could be an opportunity to increase our EV sales and reduce our carbon footprint. The anticipated lack of EV charging infrastructure is a risk to long-term EV sales. Therefore, we are engaged with the electric utility industry, utility regulators, states, EV charging service providers and numerous EV-related infrastructure efforts, to pave the way for sustained EV charging infrastructure investments. In the past year, GM has supported over 20 utilities in program filings, testified at more than 10 state/federal legislative and regulatory hearings and reviewed state plans. We've initiated a national collaborative stakeholder effort to drive available state funding towards EV infrastructure and funded another collaborative industry effort to educate state utility regulators on the benefits of EVs and the need for utilities to prepare for this "smart" load. It's now expected that over the next several years, we will see major EV infrastructure investments across the U.S., including a combined \$260 million or more in state-directed funds, an additional \$500 million investment in a national infrastructure program and at least \$300 million in utility investments.
Supply chain and/or value chain	Impacted for some suppliers, facilities, or product lines	Driven by climate change and other related factors such as air quality and energy security, risks to our business include GHG and fuel consumption standards have become more stringent to meet policy priorities. Suppliers play a key role in helping GM mitigate risks and take advantage of new opportunities. GM is planning to launch multiple new EVs by 2023 and are working to reduce near-term costs associated with EVs. Suppliers develop or assist in the development of new technologies which affect all aspects of our business from vehicle development, supply chain, marketing, and operations helping to meet regulations and changing consumer preferences. Suppliers such as LG Chem and LG Electronics, Inc., helped integrate a 60-kWh, lithium-ion battery pack in the award-winning Chevrolet Bolt EV, while Magna Exteriors developed a multi-axial laser cutting and welding process on painted thermoplastic, enabling lighter weight design of the 2018 Chevrolet Camaro XL1 fascia which helps with fuel efficiency and we believe consumer appeal for a positive opportunity, but with a medium impact.
Adaptation and mitigation activities	Impacted for some suppliers, facilities, or product lines	Droughts have been more extreme and lasting longer in recent years thanks in part to climate change. GM experiences risk to the continuance of manufacturing operations at our San Luis, Mexico Assembly and Transmission facilities due to water stress brought on by drought. Mitigation efforts include integrating water conservation into our business plan and installation and operation of Zero Liquid Discharge technology equipment to reduce stress on the non-renewable wells. Manufacturing vehicles in the water stressed area of San Luis Potosi, Mexico, provides GM with an opportunity to show leadership in water reduction, recycling, and reuse. Providing jobs in a water stressed area while having minimum impact on the aquifer provides positive local, regional, and global recognition of the extreme efforts taken by GM to protect and conserve water, one of our most precious and important natural resources. We expect a medium impact to reputational opportunity from our efforts in San Luis, Mexico GM Assembly plant.
Investment in R&D	Impacted for some suppliers, facilities, or product lines	Costs for research, manufacturing engineering, product engineering and design and development activities relate primarily to developing new products or services or improving existing products or services including activities related to vehicle and greenhouse gas (GHG) emissions control, improved fuel economy, electrification, autonomous vehicles, the safety of drivers and passengers, and urban mobility. Research and development expenses were \$7.8 billion in 2018. In comparison, R&D costs were 90% of our total capital expenditure in 2018 for a medium impact to the business.
Operations	Impacted	GM has integrated energy and carbon management into its business plan for every major operating facility globally. Additionally, to meet our company goals for energy and carbon intensity reduction, each of approximately 120 facilities has a sufficiency plan to implement efficiency projects to meet their goal. The impact to GM in 2018 was a savings of about \$20 M USD in operating cost from 240 energy and carbon savings projects in our operations. Although this is only 0.2% of GM's net income with a small impact, energy savings equates to carbon savings and when it's done with a reasonable return on investment, GM has a win/win for our bottom line and the environment.
Other, please specify	Please select	

## C2.6

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

	Relevance	Description
Revenues	Impacted for some suppliers, facilities, or product lines	GM applied for and received \$3 M USD in utility incentives as part of our \$29M spend for energy efficiency project investment. Utility incentives are treated as revenue and are included in our financial planning. Although this is a small impact to total revenue, it enables energy savings projects to be implemented which equates to carbon savings and when it's done with a reasonable return on investment, GM has a win/win for our bottom line and the environment.
Operating costs	Impacted	GM invested \$20M of operating expense in 2018 in energy savings and carbon reduction projects to save \$13 M in operating cost at our approximately 120 manufacturing, and other facilities globally . Although this is only 0.1% of GM's net income with a small impact, energy savings equates to carbon savings and when it's done with a reasonable return on investment, GM has a win/win for our bottom line and the environment.
Capital expenditures / capital allocation	Impacted	GM invested \$9M of capital expenditures in 2018 in energy savings and carbon reduction projects to save \$8 M in operating cost at our approximately 120 manufacturing, and other facilities globally . Although this is only 0.1% of GM's net income with a small impact, energy savings equates to carbon savings and when it's done with a reasonable return on investment, GM has a win/win for our bottom line and the environment.
Acquisitions and divestments	Impacted for some suppliers, facilities, or product lines	GM's vision of a future with zero crashes, zero emissions, and zero congestion includes autonomous vehicles (AV) and advanced mobility. As part of that vision, GM acquired Cruise in 2016 for \$581M and invested \$500M in Lyft to enhance our participation in AV and mobility. As this is 8.5% of GM's net income, it has a medium impact on earnings, but is providing the needed intellectual property to meet our future goals for EV's and AV's and both investments have increased in value and GM Cruise attracted other investors.
Access to capital	Not impacted	We have not experienced an impact on access to capital based on Climate Change risks and opportunities. Although some investors factor GM's Climate Change into their investment strategies, with GM's management and goals for CO2 reduction and RE-100, investors continue to invest in GM.
Assets	Not impacted	We have not experienced an impact on Assets based on Climate Change risks and opportunities. Risks on assets due to Climate Change have been mitigated with minimal impact on GM. An example is at our San Luis Potosi Assembly plant where severe drought was mitigated with Zero Liquid Discharge and water reuse for no impact to vehicle production.
Liabilities	Not impacted	We have not experienced an impact on Liabilities based on Climate Change risks and opportunities. Risks on liabilities due to Climate Change have been mitigated with minimal impact on GM. An example is that carbon trading schemes in GM Korea provided an offset, with \$9.5M sale of carbon credits, to rising energy costs for minimal impact to liabilities.
Other	Please select	

**C3. Business Strategy**

**C3.1**

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

Yes

**C3.1a**

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

Yes, qualitative

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

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

Yes

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

i. How has the business strategy been influenced? Climate change ("CC") has influenced our short- and long-term business strategy. We recognize that we need to find lower carbon solutions for our products and operations and have publicly stated that we see an economic opportunity by lowering our carbon footprint. Our business strategy includes five key priorities, namely: 1) Earn Customers for Life; 2) Grow our Brands; 3) Lead in Technology & Innovation; 4) Drive Core Efficiencies; and 5) Build a Culture to Win. In the short term (0-5 years), GM is responding to CC by setting aggressive energy and GHG intensity reduction targets through 2020. Our 2020 GHG target is to reduce GHG intensity by 20% from 2010. As we met that target in 2017, we announced a new absolute scope 1&2 target to reduce GHG by 31% from 2010 to 2030.

The internal process used is to integrate energy reduction into our business plan. Annually, we develop energy and GHG reduction targets at a global, regional, and facility level and include methods in our annual business planning process which GM calls its Business Plan Deployment (BPD). These methods include behavioral - cold shutdown, energy efficiency - LED lights, HVAC controls, and low carbon solutions - for example use of landfill gas to generate electricity. Each month data is collected on energy use and carbon emissions performance which is compared, at each site, to the target, and if it is not met, countermeasures are developed to meet the targets. An example of how this process has influenced the business strategy is the development of an ongoing dedicated fund for energy savings projects of \$20 million USD and use of energy performance contracting to fund the energy and carbon reduction methods. In 2018, energy and carbon reduction projects resulted in 4% carbon reduction on an absolute basis.

GM's global risk management process includes CC issues such as policy/regulatory changes and changing consumer behaviors are discussed at our Board of Directors, Executive Operations Committee (highest management committee), Corporate Strategy Committee, and the Product Development Committee.

To achieve our long term (>5 years) carbon reduction plans, we are focusing on our total carbon footprint, including use of sold products (vehicles). For our vehicles, we have established and publicly disclosed carbon reduction goals. Annually, we track our progress to these goals using market sales and measured vehicle emission factors by our Public Policy Group and regional resources. To ensure that we meet these goals on a long-term basis, in 2017 we invested \$7.3B in research and development activities. This includes strategic planning to develop and bring to market affordable products that incorporate technologies that improve vehicle safety, displace petroleum with biofuels and electricity, increase fuel efficiency, reduce emissions, and provide additional value and benefits to our customers. In keeping with this strategy, we remain committed to bringing more electrified and fuel-efficient options to market. In 2018, GM had over 300,000 vehicles on the road in US with some form of electrification- which includes eAssist, two-mode hybrid, extended-range electric vehicle and all electric vehicle models.

ii. What aspects of climate change have influenced the strategy?

Events such as extreme weather, national, state/provincial and/or policy changes to address CC, including new and proposed fuel economy/CO<sub>2</sub> emission standards around the world as well as adaption purposes for consumer behavior have influenced the strategy.

iii. The most important components of the short-term strategy that have been influenced by CC:

With energy management integrated into our BPD, we're engaging employees in our efforts to reduce energy and carbon to increase awareness about climate change. We have a dedicated fund for energy and carbon reduction projects which has enabled us to further reduce energy and carbon in our facilities thanks to employee suggestions. An example of this is the implementation of team member Energy Observation Tours, which, similar to safety tours, help to find and implement energy savings opportunities.

iv. The most important components of the long-term strategy that have been influenced by CC: We have an aggressive focus on advanced propulsion technologies that will benefit customers and the environment as we strive toward a zero-emission future. We focus on inventions that make our vehicles more sustainable. We operate global engineering centers and R&D labs and collaborate with academia, suppliers, and start-up companies to identify, develop, and implement new technologies as well as new business models that will provide more value to our customers as well as use less materials, require less energy to build, and emit fewer GHG emissions.

v. How this is gaining you strategic advantage over your competitors?

Our R&D progress is significant. We've received more than 700 patents in fuel cell technologies since 2002--more than any other company-- and we lead all companies in terms of most U.S. clean-energy patents granted since 2002, according to Clean Energy Patent Growth Index of U.S. Patents.

vi. What have been the most substantial business decisions made?

The most substantial business decision made for GM was our long-term strategic decision to be a leader in electrified, connected, shared, and autonomous vehicles.

The most substantial aspect of climate change that has influenced this decision was the increasing concentration of CO<sub>2</sub>e ppm concentration in Earth's atmosphere which is leading countries around the world to enact increasingly more stringent fuel efficiency and CO<sub>2</sub> emission regulations and leading cities to restrict or prohibit the use of some vehicles in city centers. CC is influencing consumer behavior and governmental policies / regulations that affect our products, manufacturing facilities, and business models. Our strategy enables us to look for opportunities in these changing preferences and policies.

GM supported the following key decisions in 2018 - Operate in a more transparent manner and actively request external input from stakeholders, -Nine manufacturing commitments with **2020 targets including RE-100 and carbon reduction from our facilities of 20% from a 2010 baseline which was achieved**, -Accelerate & expand the electrification of GM's global fleet to take advantage of changing consumer behaviors and preferences, -Execute a light-weighting initiative to make all of our vehicle products more fuel efficient, -continue to invest in a new car and ride-sharing brand, MAVEN, - Continue to invest in Cruise Automation, a leader in autonomous vehicle technology, and - Provide access to registered software developers into GM OnStar's proprietary application program interface to take advantage of changing consumer behaviors with their permission.

### C3.1d

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

Climate-related scenarios	Details
2DS	<p>The integration of sustainability and climate change into our business continues to be a focus, and both have been incorporated into our risk management process. This places both topics at the forefront of daily decision-making throughout the company and ensures continuous management and evaluation at the highest levels of the company. As an example of this management, we recently addressed climate change risks and opportunities through a scenario planning workshop. The workshop was based on a key assumption that the world is on a path by 2030 to limit emissions so that temperatures increase no more than 2 degrees Celsius. Sponsored by GM's Corporate Secretary and the head of GM's product portfolio planning, the exercise — led by Strategic Risk Management and Sustainability organizations — brought together a broad, cross-functional team, from public policy to global propulsion systems to business intelligence. Goals included developing and understanding a range of different world scenarios; identifying risks, opportunities and success factors for GM; and making recommendations for GM to analyze, prepare, adapt and act. The group considered four different scenarios in a maximum 2-degree warmer world and walked through a three-step process. The first step was to explore uncertainties and then to define success in this future world. The final step involved an analysis to determine what GM should be doing now to influence its future. All four scenarios shared common themes. Within the vehicle market, for example, it was assumed that new passenger vehicles would be required to make faster and greater adjustments than other users of energy; significant changes in the vehicle ownership paradigm; and a decline in the proportion of single-person vehicle miles. The exercise helped to clarify risks but also highlighted opportunities as well, many of which are already well underway at GM today. Some examples include:</p> <ul style="list-style-type: none"> <li>• Adapting new business models aggressively, which is evident at Cruise and its push to commercialize autonomous technology in the near future.</li> <li>• Launching new personal mobility services such as Maven.</li> <li>• Responding to new energy vehicle regulations in China with the introduction of two new EVs in 2018. (i) China will implement a unique China 6 emission standard that combines elements of both European and U.S. standards and includes more stringent emission requirements and increases the time and mileage periods over which manufacturers are responsible for a vehicle's emission performance. Nationwide implementation for new registrations is expected in July 2020 for China 6a and July 2023 for the more stringent China 6b standard. (ii) To meet the future China standard, a mix of EV's is required. (iii) In 2018, we introduced two new all-electric vehicles in China, based on what we have learned from developing the Chevrolet Bolt EV: the Buick Velite 6 EV and the Baojun E200. China is the world's largest EV market, and a major driver of EV adoption. (iv) GM is number 2 in market position in China and production of EV's resulted in 34,000 Velites, E100, and E200 vehicles produced in 2018 on a pathway to meet China 6 GHG emissions regulations in the future.</li> <li>• Focusing on new technologies by shifting capital resources and talent toward vehicle electrification programs.</li> <li>• Prioritizing renewable power sources and zero carbon footprints for manufacturing of electric vehicles. All of these moves require GM, as never before, to think like a market entrant rather than an incumbent. The workshop underscored the reality that the need to limit global warming is influencing consumer choices and brand perception today. Climate change concerns also are likely to drive new policy and regulations, as well as political and economic pressures to reduce emissions throughout the manufacturing value chain. And, the exercise validated the need for GM to continue to develop and sustain a comprehensive climate change strategy.</li> </ul>

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

**(C-AC3.1e/C-CE3.1e/C-CH3.1e/C-CO3.1e/C-EU3.1e/C-FB3.1e/C-MM3.1e/C-OG3.1e/C-PF3.1e/C-ST3.1e/C-TO3.1e/C-TS3.1e)**  
**Disclose details of your organization's low-carbon transition plan.**

GM's low-carbon transition plan is through renewable energy and vehicle electrification. Our renewable electricity commitment of 100% use in our operations by 2050 (RE-100) will provide for near zero of GHG in our scope 2 emissions. Our four-tier approach includes: increasing energy efficiency in our operations, sourcing renewable electricity, addressing intermittent supply through storage, and influencing policy to drive scale. We achieved 20% on a power (MW) basis and 9% on MWh basis in 2018.

Additionally, working with governments and utilities for expanded use of renewable electricity globally will greatly reduce carbon in our supply chain (#2 scope 3 GHG) and reduce our #1 scope 3 emission from use of our sold products, including ride share activities. The fourth tier of our RE-100 strategy is to drive scale, globally, for the use of renewable electricity to enhance decarbonization.

Another element of our low-carbon transition plan is reducing operational waste to further reduce our scope 3 emissions. Using EPA WARM model, GM tracks progress of carbon reduction through waste reuse, recycle, and reduction of landfill materials. In 2018, GM avoided 6.8 Million metric tons of CO2e emissions from landfill-free activities - reuse, re-purpose, and/or recycling our wastes. The amount of GHG avoided is more than our combined scope 1 and 2 emissions from our operations. Additionally, we have a goal to have 150 landfill-free sites by 2020 and are on a pathway to meet the 2020 goal with 137 sites landfill-free in 2018.

Lastly, to address scope 3 emissions from the use of our sold products, we are committed to an all-electric future with zero emissions. To achieve this long-term goal, GM currently sells 12 models globally with some form of electrification and will be launching two new vehicles in 2019 with more planned in the future.

## C4. Targets and performance

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### C4.1

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

Both absolute and intensity targets

### C4.1a

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

**Target reference number**

Abs 1

**Scope**

Scope 1 +2 (market-based)

**% emissions in Scope**

100

**Targeted % reduction from base year**

31

**Base year**

2010

**Start year**

2018

**Base year emissions covered by target (metric tons CO2e)**

6173746

**Target year**

2030

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

Yes, we consider this a science-based target, but this target has not been approved as science-based by the Science-Based Targets initiative

**% of target achieved**

26

**Target status**

New

**Please explain**

GM met our Scope 1 and 2 GHG 2020 goal in 2017 and developed an absolute goal to 2010-2030, based on science, to limit global temperature rise to below 2 degrees Celsius above pre-industrial levels. Energy efficiency in our operations and RE100 provide the methods to meet our goal in the future. The model used is from Ecofys and is consistent with Science Based Initiative ("SBTi") for general industry for Scope 1 and 2 and is based on market-based emissions. As we are working on scope 3 SBTi, along with other OEMs, we will apply for SBTi when scope 3 goals are finalized.

---

**Target reference number**

Abs 2

**Scope**

Scope 3: Use of sold products

**% emissions in Scope**

100

**Targeted % reduction from base year**

2

**Base year**

2016

**Start year**

2017

**Base year emissions covered by target (metric tons CO2e)**

0

**Target year**

2021

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

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

**% of target achieved**

52

**Target status**

Underway

**Please explain**

GM is implementing a short-term goal to reduce vehicle emissions with advanced technologies: Stop-Start, Downsized Turbo, and Advanced Transmissions. The goal will be met with aggressive penetration into vehicle markets by 2021. It is based on reducing GHG emissions during the use phase of sold vehicles starting at 0 in 2016 and reducing an absolute amount of 390,290 metric tons on GHG by 2021. With 202,962 metric tons GHG reduced by 2018 with advanced technologies, we are at 52% of our goal.

---

C4.1b

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

**Target reference number**

Int 1

**Scope**

Scope 1 +2 (market-based)

**% emissions in Scope**

100

**Targeted % reduction from base year**

20

**Metric**

Metric tons CO2e per vehicle produced\*

**Base year**

2010

**Start year**

2010

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

6173746

**Target year**

2020

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

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

**% of target achieved**

100

**Target status**

Achieved

**Please explain**

General Motors met its GHG target in 2017 with 22% intensity reduction compared to 2020 target of 20% and continue to exceed it in 2018. Even with a 27% increase in vehicle volume produced, we were able to reduce absolute emissions. We have added an additional absolute target out to 2030, based on science, to limit global temperature rise to below 2 degrees Celsius above pre-industrial level. Energy efficiency and our RE-100 progress were key success factors in achieving our carbon reduction goal 3 years early and will provide the actions to achieve our 2030 goals.

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

-8

**% change anticipated in absolute Scope 3 emissions**

-3.7

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**C4.2**

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

**Target**

Renewable electricity consumption

**KPI – Metric numerator**

100% renewable electricity use in all GM operations by 2050 (RE-100). We revised the description from % to total electric use in MWh. Total MWh use changes every year, our goal is clearly RE-100.

**KPI – Metric denominator (intensity targets only)**

Not Applicable

**Base year**

2016

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**Start year**

2017

**Target year**

2050

**KPI in baseline year**

293458

**KPI in target year**

8294117

**% achieved in reporting year**

9

**Target Status**

Revised

**Please explain**

GM announced a renewable energy goal in September 2016 to use 100% renewable electricity by 2050 in our global facilities operations. Our four-tier approach includes - increasing energy efficiency in our operations, sourcing renewable electricity, addressing intermittent supply through storage, and influencing policy to drive scale. In 2018, we are using renewable electricity at 20% based on MW basis and 9% on MWh basis. We anticipate being at 20% by the end of 2019 based on MWh calculation. For disclosure, this year we revised the description from % to total electric use in MWh. Although total use (MWh) changes every year, our goal is clearly RE-100 by 2050.

**Part of emissions target**

RE-100 compliments our Scope 2 portion of the GHG targets for operations of absolute GHG reduction of 31% for both scope 1 and 2 market based from 2010 to 2030.

**Is this target part of an overarching initiative?**

RE100

**Target**

Energy usage

**KPI – Metric numerator**

Energy use in GM operations globally, including manufacturing and non-manufacturing.

**KPI – Metric denominator (intensity targets only)**

Vehicles produced

**Base year**

2010

**Start year**

2010

**Target year**

2020

**KPI in baseline year**

2.31

**KPI in target year**

1.85

**% achieved in reporting year**

60

**Target Status**

Underway

**Please explain**

Energy efficiency and conservation is integrated into our manufacturing business plan within the continuous improvement element. Based on reduced volume in 2018 compared to 2017 and a large amount of product launch activities, our energy target is above the pathway to 2020. We are increasing our Energy Performance activities to ensure that we meet our 2020 goal.

**Part of emissions target**

Our energy intensity reduction target is a key success factor in GHG reduction goal as is a top priority in our RE-100 goal.

**Is this target part of an overarching initiative?**

RE100

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**Target**

Waste

**KPI – Metric numerator**

Kilograms of Waste generated in operations

**KPI – Metric denominator (intensity targets only)**

Vehicles produced

**Base year**

2010

**Start year**

2010

**Target year**

2020

**KPI in baseline year**

307

**KPI in target year**

186

**% achieved in reporting year**

67

**Target Status**

Underway

**Please explain**

Reducing waste in GM's operations provides an important part of our low-carbon transition plan. Using EPA WARM model, GM tracks progress of carbon reduction through waste reuse, recycle, and reduction of landfill materials. In 2018, GM avoided 6.8 Million metric tons of CO2e emissions from landfill-free activities which is more than our combined annual scope 1 and 2 emissions. Additionally, we have a goal to have 150 landfill-free sites by 2020 and are on a pathway to meet the 2020 goal with 137 landfill-free sites in 2018.

**Part of emissions target**

Although our waste and landfill free goals have a positive impact on our scope 3 metrics, they are not currently part of a target

**Is this target part of an overarching initiative?**

Other, please specify (Waste targets and drive for reduce, reuse, and recycle helps to decarbonize our business (Scopes 1-3). Our efforts in 2018 resulted in avoiding CO2e emissions of 6.8 Million tons, more than our scope 1 & 2 emissions combined)

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**C4.3**

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**(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**

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

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	250	400000
To be implemented*	240	357033
Implementation commenced*	240	357033
Implemented*	240	357033
Not to be implemented	10	42967

## C4.3b

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

**Initiative type**

Energy efficiency: Building fabric

**Description of initiative**

Other, please specify (Replace windows with metal siding, seal building openings, and cut and cap unused exhaust stacks to reduce infiltration in building)

**Estimated annual CO2e savings (metric tonnes CO2e)**

10077

**Scope**

Scope 1

**Voluntary/Mandatory**

Voluntary

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

1585431

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

3520883

**Payback period**

1-3 years

**Estimated lifetime of the initiative**

6-10 years

**Comment**

Sealing up old buildings reduces the amount of heat and air conditioning needed for people comfort and process requirements.

**Initiative type**

Energy efficiency: Building services

**Description of initiative**

Other, please specify (HVAC, Lighting, motors and drives)

**Estimated annual CO2e savings (metric tonnes CO2e)**

166764

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

10965520

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

21927762

**Payback period**

1-3 years

**Estimated lifetime of the initiative**

6-10 years

**Comment**

Upgrading building management controls, replacing old inefficient motors and lights with LED provides great paybacks. We use Energy Treasure hunts to find and implement opportunities.

---

**Initiative type**

Energy efficiency: Processes

**Description of initiative**

Process optimization

**Estimated annual CO2e savings (metric tonnes CO2e)**

38096

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

5364290

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

3126438

**Payback period**

<1 year

**Estimated lifetime of the initiative**

3-5 years

**Comment**

Optimizing process use of energy provides a quick payback in reduced compressed air, chilled water, electricity, and heat for process use.

---

**Initiative type**

Low-carbon energy purchase

**Description of initiative**

Wind

**Estimated annual CO2e savings (metric tonnes CO2e)**

131087

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

373134

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

0

**Payback period**

No payback

**Estimated lifetime of the initiative**

11-15 years

---

**Comment**

Combination of wind PPAs and alternate heating sources provide low carbon purchases resulting in CO2e reductions.

---

**Initiative type**

Process emissions reductions

**Description of initiative**

Changes in operations

**Estimated annual CO2e savings (metric tonnes CO2e)**

6922

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

844008

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

700000

**Payback period**

<1 year

**Estimated lifetime of the initiative**

3-5 years

**Comment**

Optimizing the use of equipment for processes reduces CO2e emissions.

---

**Initiative type**

Other, please specify (Behavioral changes that are incorporated into our business plan that reduce CO2e - process equipment and improved shutdown)

**Description of initiative**

<Not Applicable>

**Estimated annual CO2e savings (metric tonnes CO2e)**

4087

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

462056

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

0

**Payback period**

<1 year

**Estimated lifetime of the initiative**

1-2 years

**Comment**

Optimizing equipment schedules and non-production shutdown by modifying our business plan provides quick payback and CO2e savings.

---

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

Method	Comment
Dedicated budget for energy efficiency	GM uses a dedicated budget for energy efficiency projects in operations. In 2018, we dedicated and spent \$11M USD with 1.8-year payback.
Employee engagement	Energy management and carbon reduction is integrated into our business plan which engages employees at all levels of the organization.
Internal price on carbon	GM has operations in countries with carbon trading schemes, e.g. South Korea, where we have realized real savings from energy efficiency with sales of credits into the market to fund energy efficiency projects. Our internal price in this instance was \$25 per ton. We developed a method to prioritize energy savings projects using a shadow price on carbon.

**C4.5**

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

Yes

**C4.5a**

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

**Level of aggregation**

Group of products

**Description of product/Group of products**

Our 2018 EV portfolio includes electric vehicles—such as our Chevy Bolt—and extended range vehicles—such as our Chevy Volt—and are sold globally. These vehicles have lower emissions compared to internal combustion engine vehicles. The Bolt offers an EPA estimated range of 238 miles and 60 kWh battery capacity while the Extended Range Volt offers an electric range of 53 miles and has sold more than 170,000 units since 2010. Electric vehicles and extended range vehicles sold globally with lower emissions than comparable vehicles available for sale provide our customers GHG reduction opportunities.

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

Low-carbon product and avoided emissions

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

Other, please specify (Fueleconomy.gov provides a method to calculate the emissions of low-carbon products as well as the equivalent emissions of a conventional vehicle for GHG comparison.)

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

1.4

**Comment**

GM produces Electric vehicles and extended range vehicles sold globally (e.g. E200, Bolt and Volt) with lower emissions than comparable internal combustion vehicles sold. Comparing similar vehicles for sale, using US EPA fuel economy comparison at [www.fueleconomy.gov](http://www.fueleconomy.gov) GM's sales of Volt and Bolt vehicles avoids 398,661 metric tons GHG on a life cycle basis.

**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 2010

**Base year end**

December 31 2010

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

1902196

**Comment**

Baseline restated in 2017 for 2010 due to significant divestiture of assets in Europe, India, and Africa.

**Scope 2 (location-based)**

**Base year start**

January 1 2010

**Base year end**

December 31 2010

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

4271550

**Comment**

Baseline restated in 2017 for 2010 due to significant divestiture of assets in Europe, India, and Africa.

**Scope 2 (market-based)**

**Base year start**

January 1 2010

**Base year end**

December 31 2010

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

4271550

**Comment**

Baseline restated in 2017 for 2010 due to significant divestiture of assets in Europe, India, and Africa.

**C5.2**

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

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

US EPA Mandatory Greenhouse Gas Reporting Rule

**C6. Emissions data**

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**C6.1**

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**(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)**

1763555

**Start date**

January 1 2018

**End date**

December 31 2018

**Comment**

98% verified by 3rd party

C6.2

---

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

**Row 1**

**Scope 2, location-based**

We are reporting a Scope 2, location-based figure

**Scope 2, market-based**

We are reporting a Scope 2, market-based figure

**Comment**

Based on GM's RE-100 commitment, we chose to use market based GHG emissions for our reduction goal.

C6.3

---

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

**Reporting year**

**Scope 2, location-based**

4322761

**Scope 2, market-based (if applicable)**

3924338

**Start date**

January 1 2018

**End date**

December 31 2018

**Comment**

C6.4

---

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

Yes

C6.4a

---

**(C6.4a) Provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure.**

**Source**

Small office facilities

**Relevance of Scope 1 emissions from this source**

Emissions are not relevant

**Relevance of location-based Scope 2 emissions from this source**

Emissions are not relevant

**Relevance of market-based Scope 2 emissions from this source (if applicable)**

Emissions are not relevant

**Explain why this source is excluded**

Small offices have insignificant GHG emissions and are difficult to include in our monitoring system.

---

**C6.5**

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**(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**

41330301

**Emissions calculation methodology**

Following the GHG Protocol, this Supply Chain analysis is "cradle-to-gate" for emissions associated with the value chain from material extraction through manufacturing. The use and disposal phases of the product are omitted in this case. Using annual spend provided by General Motors as the Company's activity data combined with emissions factors from the Climate Earth's Environmental Database, the core of which is the USEPA Environmental Extended Input Output database (USEEIO v1.1) which provides industry average cradle-to-gate emissions factors for economic sectors. Due to the complexities of large supply chains, the WRI Corporate Value Chain Accounting and Reporting Standard (WRI Scope 3 Standard) specifically permits the use of industry average emissions factors combined with direct company activity data. General Motors has provided complete direct spend activity data for the Company for the reporting year. The methodology employed for these calculations conforms to the WRI Corporate Value Chain (Scope 3) Accounting and Reporting Standard. The model provides tier analysis and industry analysis to provide strategic planning to reduce life cycle GHG emissions for auto parts. The majority of GHG is in tiers 2-6 and in electric and steel industries. In 2018 as the variance to spend was small, we used 2017 LCA and adjusted by spend variance for each category of auto parts.

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

50

**Explanation**

Spend data is a key component of the economic input output analysis and is derived from supplier spend at a manufacturing country level for increased granularity. This is extremely important for water life cycle analysis since location is important for water security. GM uses WRI protocol using life cycle detailed analysis for auto parts for company owned operations. As a calibration method, CDP Supply Chain tier 1 data is compared to improve accuracy. This data was verified by a 3rd party in 2017.

## Capital goods

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

4384329

### Emissions calculation methodology

Following the GHG Protocol, this Supply Chain analysis is "cradle-to-gate" for emissions associated with the value chain from material extraction through manufacturing. The use and disposal phases of the product are omitted in this case. Using annual spend provided by General Motors as the Company's activity data combined with emissions factors from the Climate Earth's Environmental Database, the core of which is the USEPA Environmental Extended Input Output database (USEEIO v1.1) which provides industry average cradle-to-gate emissions factors for economic sectors. Due to the complexities of large supply chains, the WRI Corporate Value Chain Accounting and Reporting Standard (WRI Scope 3 Standard) specifically permits the use of industry average emissions factors combined with direct company activity data. General Motors has provided complete direct spend activity data for the Company for the reporting year. The methodology employed for these calculations conforms to the WRI Corporate Value Chain (Scope 3) Accounting and Reporting Standard. The model provides tier analysis and industry analysis to provide strategic planning to reduce life cycle GHG emissions for Capital Goods. In 2018 as the variance to spend was small, we used 2017 LCA and adjusted by spend variance for each category of Capital Goods.

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

50

### Explanation

Spend data is a key component of the economic input output analysis and is derived from supplier spend at a manufacturing country level for increased granularity. This is extremely important for water life cycle analysis since location is important for water security. GM uses WRI protocol using life cycle detailed analysis for auto parts for company owned operations. As a calibration method, CDP Supply Chain tier 1 data is compared to improve accuracy. This data was verified by a 3rd party in 2017.

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

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

354415

### Emissions calculation methodology

Using Australia's National Greenhouse Accounts (NGERS) factors 2018, natural gas fugitive emissions of GHG not included in Scope 1 or 2 were estimated globally based on scope 1 use. USEIA estimates electric losses and the factor was applied globally using scope 2 emissions to estimate fugitive electric GHG not accounted for in scope 2 calculations.

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

50

### Explanation

NGERS and USEIA factors account for half of the calculation; whereas, actual data from scope 1 and 2 comprise the remaining portion of data. This data was verified by a 3rd party in 2018. Based on the methodology used, the value is 6% and exceeds the 5% threshold of relevancy established compared to the total of Scope 1 and 2 emissions and therefore determined to be relevant. Reduction of Scope 1 and 2 reduces this scope 3 emission.

## Upstream transportation and distribution

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

2749778

### Emissions calculation methodology

GM is a member of EPA SmartWay and used their methodology to obtain GHG emissions, based on truck distances and fuel efficiency according to GHG Protocol for GM's North America parts delivery from third party over the road logistics providers. Ocean emissions intensity was evaluated using a major supplier's carbon accounting and extrapolating using revenue intensity. Rail and Air emissions for all global upstream transportation GHG were estimated using CDP Analytics for similar companies multiplied by revenue spend. Truck emissions for rest of world were calculated using emission factors from EPA SmartWay. Based on small variance in auto parts spend in 2018, we used a revenue ratio based on emissions from 2017 for 2018 emissions of GHG.

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

50

### Explanation

SmartWay provides data from carriers using fuel use and distances travelled. Revenue spend is from suppliers and CDP analytics provides companies revenue intensities as secondary data. The quantity is about half of scope 1 and 2 and is relevant to our carbon footprint.

## Waste generated in operations

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

18082

### Emissions calculation methodology

USEPA WasteWise model applied with GM Global waste data. GM avoided 6.8 Million metric tons by reusing, recycling, and composting significant quantities of materials. In 2018 we had 137 land-fill free sites globally that provides more than a total offset from waste reuse and recycle activities to our Scope 1 & 2 GHG emissions.

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

50

### Explanation

Reuse, recycling, incineration, and landfill activities are inputs to WARM model from actual data and the remaining calculation from WARM uses secondary data factors. As GM increases its waste reuse and recycling, our GHG from waste to landfill is reduced accordingly. In 2018, GM avoided 6.8 Million tons of GHG through reduction, reuse, recycle, and composting materials and had 139 Landfill-free sites. Although CO2e reductions have reduced it to below relevant levels, we continue to treat it as relevant due to the huge offset opportunity as reuse and recycling avoids more than our scope 1 & 2 emissions combined.

## Business travel

### Evaluation status

Not relevant, calculated

### Metric tonnes CO2e

54270

### Emissions calculation methodology

GHG Protocol method was used by our 3rd party travel agent to calculate Air Business travel GHG emissions for our global operations from 2018 data.

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

50

### Explanation

Distances travelled is primary data and emission factors is secondary. Based on the methodology used, the value is 1% or much less than the 5% threshold of relevancy established compared to the total of Scope 1 and 2 emissions and therefore determined to be not relevant.

## Employee commuting

### Evaluation status

Not relevant, calculated

### Metric tonnes CO2e

129750

### Emissions calculation methodology

Using CDP Analytics, an average of employee commuting intensity per employee was calculated and applied to GM's total employee number to estimate our GHG associated with employee commuting.

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

25

### Explanation

Based on the methodology used, the value is 2% or much less than the 5% threshold of relevancy established compared to the total of Scope 1 and 2 emissions and therefore determined to be not relevant.

## Upstream leased assets

### Evaluation status

Not relevant, calculated

### Metric tonnes CO2e

10077

### Emissions calculation methodology

GM's leased asset facility area was used along with the GHG intensity of similar facilities to estimate the GHG from GM's global upstream leased assets.

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

50

### Explanation

Based on the methodology used, the value is 0.1% or much less than the 5% threshold of relevancy established compared to the total of Scope 1 and 2 emissions and therefore determined to be not relevant. Area of leased space is primary data and intensity factors is secondary.

## Downstream transportation and distribution

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

1460808

### Emissions calculation methodology

GM is a member of EPA SmartWay and used their methodology to obtain GHG emissions, based on truck distances and fuel efficiency according to GHG Protocol for GM's North America parts delivery from third party over-the-road logistics providers. Ocean emissions intensity was evaluated using a major supplier's carbon accounting and extrapolating using revenue intensity. Rail and Air emissions for all global upstream transportation GHG were estimated using CDP Analytics for similar companies multiplied by revenue spend. Truck emissions for rest of world were calculated using emission factors from EPA SmartWay. Based on small variance in auto parts spend in 2018, we used a revenue ratio based on emissions from 2017 for 2018 emissions of GHG.

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

50

### Explanation

SmartWay provides data from carriers using fuel use and distances travelled. Revenue spend is from suppliers and CDP analytics provides companies revenue intensities as secondary data. The quantity is about half of scope 1 and 2 and is relevant to our carbon footprint.

## Processing of sold products

### Evaluation status

Not relevant, calculated

### Metric tonnes CO2e

120731

### Emissions calculation methodology

GM sells boat engines as an intermediate product to boat manufacturers and customers for recreational use. Based on estimates from boatcarbonfootprint.com, including average hours of operation and fuel efficiency for gasoline engines and USEPA emission factors, a total GHG amount for the use of sold products was calculated and extrapolated for total carbon footprint.

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

25

### Explanation

Based on the methodology used, the value is 2% or less than the 5% threshold of relevancy established compared to the total of Scope 1 and 2 emissions and therefore determined to be not relevant.

## Use of sold products

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

210371702

### Emissions calculation methodology

GHG from the Use of Sold products or vehicles is calculated using the average regional CO2e emissions per vehicle multiplied by life cycle distance driven by customers of 150,000 km over 10 years and multiplied by 2018 sales volumes. Regional emission factors are calculated using governmental methods in countries such as, USA, Brazil, and China. Additionally, fugitive emissions of Mobile air conditioning units are calculated using WRI method 3 and added for total estimated GHG emissions. The regions utilized for emission factors are USA, Brazil, and China based on the most fully developed regulatory monitoring and measurement systems. Vehicle emissions were verified by a third party, except for mobile air conditioning, which accounts for less than 1% and getting less as GHG friendly refrigerants like HF1234yf are being used.

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

50

### Explanation

2018 calculation of life cycle GHG from vehicles sold is done using regional vehicle emissions rates for increased granularity. Vehicle emissions were verified by a third party, except for mobile air conditioning fugitive emissions of GHG, which accounts for less than 1% and getting less as more Climate Change friendly refrigerants like HF1234yf are being used in-lieu of R134a.

## End of life treatment of sold products

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

3353600

### Emissions calculation methodology

The total emissions are based on the "end of life" CO2e results of product life cycle analysis calculations performed at General Motors for specific automobiles and their material compositions and is multiplied by the total amount of vehicles that GM sold globally in 2018.

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

50

### Explanation

Product life cycle analysis provides a basis for GHG emissions from end of life of an automobile. Design for the Environment activities provide a method for continuous improvement in End of Life GHG. As the GHG is 58% of scope 1 and 2, it is relevant. Primary data is vehicle volume and secondary is Product LCA.

## Downstream leased assets

### Evaluation status

Not relevant, calculated

### Metric tonnes CO2e

20459

### Emissions calculation methodology

A portion of GM's global headquarters facility is leased to other tenants as well as a vehicle haul-away site. The GHG represents the estimated use from leased spaces based on energy invoice data and meter allocations. GHG emissions are calculated using GHG Protocol with E-Grid and fuel emission factors from USEPA.

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

50

### Explanation

Based on the methodology used, the value is 0.4% or much less than the 5% threshold of relevancy established compared to the total of Scope 1 and 2 emissions and therefore determined to be not relevant.

## Franchises

### Evaluation status

Not relevant, calculated

### Metric tonnes CO2e

137096

### Emissions calculation methodology

Using CDP Analytics, a representative GHG net income intensity was used along with GM's financial unit's annual 2018 income to estimate our GHG from Investment activities.

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

50

### Explanation

Based on the methodology used, the value is 1% or much less than the 5% threshold of relevancy established compared to the total of Scope 1 and 2 emissions and therefore determined to be not relevant,

## Investments

### Evaluation status

Not relevant, explanation provided

### Metric tonnes CO2e

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

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

<Not Applicable>

### Explanation

We have equity ownership stakes in entities that meet the demands of customers in other countries, primarily in China, with vehicles developed, manufactured, and/or marketed under the Baojun, Buick, Cadillac, Chevrolet, Jiefang, and Wuling brands. The emissions from these investments are included in our Scopes 1,2, and 3. Emissions from other investments, e.g. GM Cruise, are insignificant and related to small leased offices.

**Other (upstream)**

**Evaluation status**

Not evaluated

**Metric tonnes CO2e**

<Not Applicable>

**Emissions calculation methodology**

<Not Applicable>

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

<Not Applicable>

**Explanation**

We are unaware of other significant emissions.

**Other (downstream)**

**Evaluation status**

Not evaluated

**Metric tonnes CO2e**

<Not Applicable>

**Emissions calculation methodology**

<Not Applicable>

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

<Not Applicable>

**Explanation**

We are unaware of other significant emissions.

**C6.7**

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

Yes

**C6.7a**

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

**Row 1**

**Emissions from biologically sequestered carbon (metric tons CO2)**

71.76

**Comment**

A portion of landfill gas GHG emissions is considered to be biogenic. Landfill gas is used in boilers and to generate renewable energy at two of GM Assembly plants in US.

**C6.10**

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**(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**

0.67

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

5687893

**Metric denominator**

vehicle produced

**Metric denominator: Unit total**

8459236

**Scope 2 figure used**

Market-based

**% change from previous year**

3

**Direction of change**

Decreased

**Reason for change**

Implementation of RE-100 was the largest factor in reducing GHG intensity as vehicle volume reduced by 5% in 2018 from 2017, absolute reduction was 6% from a combination of RE-100 implementation and energy efficiency projects like LED lights, building management systems, and process optimization. As GM is highly vertically integrated, our Assembly plant only intensity is 0.41 tonnes per vehicle with the remainder of 0.67 tonnes/vehicle coming from internal parts production and non-manufacturing activities.

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**Intensity figure**

0.000039

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

5687893

**Metric denominator**

unit total revenue

**Metric denominator: Unit total**

147049000000

**Scope 2 figure used**

Market-based

**% change from previous year**

7

**Direction of change**

Decreased

**Reason for change**

Revenue increased by 1% and absolute GHG reduced 6% due to RE-100 implementation and energy efficiency projects, like LED lights, building management systems, and process optimization. Revenue intensity is not a good measure for automobile manufacturing as revenue is more dependent on vehicle content as opposed to energy used in operations. Energy cost is <1% of revenue and is insignificant. Energy use in operations does not correlate to vehicle content or revenue.

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## C7. Emissions breakdowns

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### C7.1

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

Yes

**C7.1a**

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

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
HFCs	77277	IPCC Fifth Assessment Report (AR5 – 100 year)
CO2	1686278	IPCC Fifth Assessment Report (AR5 – 100 year)

**C7.2**

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

Country/Region	Scope 1 emissions (metric tons CO2e)
North America	1303368
South America	59521
Other, please specify (Rest of World)	400667

**C7.3**

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

By business division

**C7.3a**

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

Business division	Scope 1 emissions (metric ton CO2e)
GM North America	1303368
GM South America	59521
GM International Operations	400667

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

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

	Gross Scope 1 emissions, metric tons CO2e	Net Scope 1 emissions , metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Electric utility generation activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	1569564	<Not Applicable>	Manufacturing vehicles includes machining engines and transmissions, stamping, body welding, paint, batteries, and assembly.
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

## C7.5

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

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
North America	2649396	2279671	5639443	637327
South America	93785	89017	467339	28164
Other, please specify (Rest of World - GM International Operations)	1579580	1555650	2730742	37984

## C7.6

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

By business division

### C7.6a

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

Business division	Scope 2, location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
GM North America	2649396	2279671
GM South America	93785	89017
GM International Operations	1579580	1555650

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

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	3847258	3492661	Manufacturing vehicles includes machining engines and transmissions, stamping, body welding, paint, batteries, and assembly.
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

C-TO7.8

**(C-TO7.8) Provide primary intensity metrics that are appropriate to your indirect emissions in Scope 3 Category 11: Use of sold products from transport.**

**Activity**

Light Duty Vehicles (LDV)

**Emissions intensity figure**

0.001275

**Metric numerator (Scope 3 emissions: use of sold products) in Metric tons CO2e**

208375500

**Metric denominator**

<Not Applicable>

**Metric denominator: Unit total**

12570000

**% change from previous year**

0.34

**Vehicle unit sales in reporting year**

8380000

**Vehicle lifetime in years**

10

**Annual distance in km or miles (unit specified by column 4)**

15000

**Load factor**

Average occupancy rates for passenger vehicles under various use scenarios according to European Environment Agency is 1.3 passengers per vehicle.

**Please explain the changes, and relevant standards/methodologies used**

GM used (3) methodologies for vehicle emissions intensities (grams/km) based on governmental standards from US EPA, China, and Brazil and applied these to the appropriate country of sale considering vehicle model similarities, e.g. use US for Canada sales and Brazil for South America sales... For mobile air conditioning HFC fugitive emissions calculation we used WRI method 3 and ARA 5 GWP for R-134a and HF1234yf. Vehicle sales are listed in GM's financial filing 10-k report with the US Securities and Exchange Commission. Passenger km is based on industry standard at 15,000 km/year and vehicle lifetime is 10 years. We used 1.3 passengers per vehicle based on average occupancy from European Environment Agency report on Occupancy rates for passenger vehicles. 2018 total vehicle emissions were flat compared to 2017: -reduction in emission intensity in Brazil, -flat performance in USA due to product mix increases in Light Duty Trucks, -slight increase in China of 1%, -a reduction based on the increased use of HF1234yf as vehicle refrigerant in 2018 versus 2017 that was mostly R-134a.

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**C7.9**

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

Decreased

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**C7.9a**

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

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	198566	Decreased	3	GM increased its renewable electric use by 7% in 2018, including wind and solar energy. The resulting reduction in GHG was 3% GHG reduction. Last year 198,566 tCO2e were reduced by a change on our renewable energy consumption/ emissions reduction activities, and our total S1 and S2 emissions in the previous year was 6,040,697 tCO2e, therefore we arrived at 3% through $(198,566/6,040,697) * 100 = 3\%$
Other emissions reduction activities	225946	Decreased	4	GM invested \$29 M USD in energy efficiency projects, including LED, building management system improvements, and process optimization for \$19M USD savings and 225,946 tons of GHG. Last year 225,946 tCO2e were reduced by implementing energy savings projects and emissions reduction activities (LED, Building Management Systems, and process improvements), and our total S1 and S2 emissions in the previous year was 6,040,697 tCO2e, therefore we arrived at 4% through $(225,946/6,040,697) * 100 = 4\%$
Divestment	0	No change	0	GM had minimal divestment that resulted in minimal GHG changes
Acquisitions	0	No change	0	GM had minimal investment in operations that resulted in small increase in GHG.
Mergers	0	No change	0	GM had minimal mergers in 2018 that resulted in insignificant change in GHG.
Change in output	142197	Decreased	3	GM vehicle production reduced in 2018 compared to 2017 resulting in about 3% reduction in GHG. Last year 142,197 tCO2e were reduced due to lower production volume, and our total S1 and S2 emissions in the previous year was 6,040,697 tCO2e, therefore we arrived at 3% through $(142,197/6,040,697) * 100 = 3\%$
Change in methodology	0	No change	0	We had minimal effect from changes in methodology.
Change in boundary	0	No change	0	We had minimal change in boundary and insignificant changes in GHG.
Change in physical operating conditions	213905	Increased	4	Global temperatures during the winter in the northern hemisphere were 0.2 Celsius colder than in 2017 resulting in higher scope 1 and 2 emissions. Additionally, new product launches resulted in increased energy use and GHG emissions. Last year 213,905 tCO2e were increased due to climate and product launch activities, and our total S1 and S2 emissions in the previous year was 6,040,697 tCO2e, therefore we arrived at 3% through $(213,905/6,040,697) * 100 = 4\%$
Unidentified	0	No change	0	None unidentified
Other	0	No change	0	None other

**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?**

Market-based

**C8. Energy**

**C8.1**

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

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

**C8.2**

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

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

**C8.2a**

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

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	78553	8286215	8364769
Consumption of purchased or acquired electricity	<Not Applicable>	759554	8294117	9049666
Consumption of purchased or acquired heat	<Not Applicable>	0	66417	66417
Consumption of purchased or acquired steam	<Not Applicable>	133347	342695	476042
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	0	<Not Applicable>	0
Total energy consumption	<Not Applicable>	971454	16989444	17956893

**C8.2b**

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

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	Yes
Consumption of fuel for the generation of cooling	Yes
Consumption of fuel for co-generation or tri-generation	Yes

**C8.2c**

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

**Fuels (excluding feedstocks)**

Landfill Gas

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

305595

**MWh fuel consumed for self-generation of electricity**

227042

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

78553

**MWh fuel consumed for self-generation of cooling**

0

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

0

**Comment**

Landfill gas is used for boilers and self- generation of electricity for on-site use at two facilities as a renewable energy source.

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**Fuels (excluding feedstocks)**

Natural Gas

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

8255046

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

4039703

**MWh fuel consumed for self-generation of steam**

4215343

**MWh fuel consumed for self-generation of cooling**

0

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

0

**Comment**

Natural Gas is used for ovens to cure paint, building heating, and generation of hot water and steam in boilers.

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**C8.2d**

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

**Landfill Gas**

**Emission factor**

0.0009

**Unit**

metric tons CO2e per MWh

**Emission factor source**

LFG is reported is allocated as biogenic and non-biogenic according to GHG Protocol. The EF is shown for non-biogenic portion only

**Comment**

**Natural Gas**

**Emission factor**

0.19

**Unit**

metric tons CO2e per metric ton

**Emission factor source**

Average of country specific EF for Natural Gas.

**Comment**

**C8.2e**

---

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

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	755549	755549	755549	755549
Heat	2188701	2188701	0	0
Steam	4215343	4215343	78553	78553
Cooling	0	0	0	0

**C8.2f**

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

**Basis for applying a low-carbon emission factor**

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

**Low-carbon technology type**

Solar PV

Biomass (including biogas)

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

North America

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

77860

**Emission factor (in units of metric tons CO<sub>2</sub>e per MWh)**

0

**Comment**

Reporting the emission factor for renewable landfill gas and solar generation.

---

**Basis for applying a low-carbon emission factor**

Power Purchase Agreement (PPA) with energy attribute certificates

**Low-carbon technology type**

Solar PV

Wind

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

Other, please specify (North America, Brazil, and China)

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

412763

**Emission factor (in units of metric tons CO<sub>2</sub>e per MWh)**

0

**Comment**

Wind and Solar PPAs where GM owns the environmental attributes.

---

**Basis for applying a low-carbon emission factor**

Contract with suppliers or utilities ( e.g. green tariff), supported by energy attribute certificates

**Low-carbon technology type**

Solar PV

Wind

Biomass (including biogas)

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

North America

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

268752

**Emission factor (in units of metric tons CO<sub>2</sub>e per MWh)**

0

**Comment**

Emission factor for Green Tariffs and RPS where customers own RECs for renewable energy.

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C-TO8.4

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**(C-TO8.4) Provide any efficiency metrics that are appropriate for your organization's transport products and/or services.**

**Activity**

Light Duty Vehicles (LDV)

**Metric figure**

2.49

**Metric numerator**

tCO<sub>2</sub>e

**Metric denominator**

<Not Applicable>

**Metric numerator: Unit total**

20837550

**Metric denominator: Unit total**

8380000

**% change from previous year**

0.34

**Please explain**

Total use of sold product is calculated annually for 2018. The method is consistent with GHG Protocol, using country regulatory vehicle emission methods for US, China, and Brazil. The GHG emission intensities are applied to every country with sales using emission factors that match the models typically sold in that country, e.g. US factors used in Canada, Brazil factors used in South America, and China used in Asia, Africa, and Middle East. Emission intensities (Grams/km) are multiplied by 15,000 km/year driven per vehicle and number of vehicles sold by country. Metric tons are normalized by sold vehicles in 2018 for metric figure reported. The numerator is annual CO<sub>2</sub>e emissions from 100% of vehicles and metric is normalized by vehicle sales. There is a slight increase due to product mix of sales in 2018 vs. 2017.

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**C9. Additional metrics**

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**C9.1**

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

**Description**

Waste

**Metric value**

137

**Metric numerator**

Number of Landfill-Free sites cumulative 2010

**Metric denominator (intensity metric only)**

Absolute metric and not applicable

**% change from previous year**

3.5

**Direction of change**

Decreased

**Please explain**

Based on either sold facilities, lack of feasibility, and cost implications, we reduced our landfill free facilities by 5 from 2017.

---

**Description**

Energy usage

**Metric value**

2.03

**Metric numerator**

MWh of total energy in operations

**Metric denominator (intensity metric only)**

Vehicles produced in operations

**% change from previous year**

4

**Direction of change**

Increased

**Please explain**

Based on a 5% volume reduction, our efficiency efforts were unable to overcome such a large reduction in volume. Additionally, climate was colder in 2018 than 2017 by 0.2 C and many product launches accounted for additional energy use.

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**C-TO9.3/C-TS9.3**

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**(C-TO9.3/C-TS9.3) Provide tracking metrics for the implementation of low-carbon transport technology over the reporting year.**

**Activity**

Light Duty Vehicles (LDV)

**Metric**

Sales

**Technology**

<Not Applicable>

**Metric figure**

66770

**Metric unit**

<Not Applicable>

**Explanation**

We set a goal of producing the world's first long-range electric vehicle at a price within reach of most American consumers, and the Chevrolet Bolt EV, now available nationwide in the United States, has enabled us to deliver on that goal. The Bolt EV builds upon lessons learned from the Chevrolet Volt, which provided long-range hybrid electric performance at an affordable price and has sold more than 130,000 units since its release in 2010. The Bolt EV represents the next generation of EV innovation, affordability and range—and, in its first year of sales, is topping charts and delighting customers across the country. Additionally, we manufactured the E100, E200, and Buick BEV in China with our JVs. The metric does not include other electrified vehicles, like hybrids and extended range vehicles.

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**C-TO9.6/C-TS9.6**

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**(C-TO9.6/C-TS9.6) What is your investment in research and development (R&D), equipment, products and services and which part of it would you consider a direct investment in the low-carbon transition?**

**Activity**

Light Duty Vehicles (LDV)

**Investment start date**

January 1 2017

**Investment end date**

December 31 2017

**Investment area**

R&D

**Technology area**

Other, please specify (Total company R&D for safety, AV, and EV)

**Investment maturity**

Applied research and development

**Investment figure**

7800000000

**Low-carbon investment percentage**

41-60%

**Please explain**

The continued development of our EV portfolio rests upon 20 years of electrification knowledge and experience and the investment of billions in research and development. Today, we estimate that about half of our Global Propulsion Systems engineering workforce is involved with alternative or electrified propulsion. We also benefit from one of the largest battery development labs in the world, as well as our own battery manufacturing facilities. Although we don't publicly state the percentage of R&D for electrification, the investment % is based on number of employees in our Global Propulsion Group working on electrification.

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## C10. Verification

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### C10.1

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

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

### C10.1a

---

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

**Scope**

Scope 1

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

Y

ver\_stmt\_final\_GM\_Global\_20190613.pdf

**Page/ section reference**

Page 2, Table 1 Scope 1 GHG Emissions - Total and breakdown

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

99

---

**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**

Limited assurance

**Attach the statement**

2

ver\_stmt\_final\_GM\_Global\_20190613.pdf

**Page/ section reference**

page 2, table 1 for total GHG location based.

**Relevant standard**

---

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**Scope**

Scope 2 market-based

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

2

ver\_stmt\_final\_GM\_Global\_20190613.pdf

**Page/ section reference**

page 2, table 1

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

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## C10.1b

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

**Scope**

Scope 3- at least one applicable category

**Verification or assurance cycle in place**

Biennial process

**Status in the current reporting year**

Complete

**Attach the statement**

3

ver\_stmt\_final\_GM\_Global\_20180830 all scopes.pdf

**Page/section reference**

page 2, table 1 - scope 3 for 4 relevant categories

**Relevant standard**

ISO14064-3

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## C10.2

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**(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

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## C10.2a

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

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C7. Emissions breakdown	Year on year change in emissions (Scope 1 and 2)	ISO-14064-3	Annual scope 1 and 2 emissions were compared, and variance year over year was verified. ver_stmt_final_GM_Global_20190613.pdf
C9. Additional metrics	Other, please specify (waste, excluding construction, demolition, and remediation)	AA1000	3rd party verified our waster data. ver_stmt_final_GM_Global_20190613.pdf

## C11. Carbon pricing

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### C11.1

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**(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

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**(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.**

China national ETS  
Korea ETS

### C11.1b

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

**China national ETS**

**% of Scope 1 emissions covered by the ETS**

11.5

**Period start date**

January 1 2018

**Period end date**

December 31 2018

**Allowances allocated**

358250

**Allowances purchased**

0

**Verified emissions in metric tons CO2e**

330768

**Details of ownership**

Other, please specify (Joint Venture ownership with managing director from GM for operations. We include active JV's in our carbon reporting and share best practices.)

**Comment**

**Korea ETS**

**% of Scope 1 emissions covered by the ETS**

33.1

**Period start date**

January 1 2018

**Period end date**

December 31 2018

**Allowances allocated**

346986

**Allowances purchased**

0

**Verified emissions in metric tons CO2e**

300961

**Details of ownership**

Facilities we own and operate

**Comment**

we sold 464,684 CO2eq tons at \$9.5 M USD from Feb 8, 2018 – Jun 26, 2019.

**C11.1d**

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

GM's strategy for participating in emissions trading schemes in Korea and China is to continue implementing energy efficiency projects and initiatives to reduce GHG and provide value from the potential sale of carbon credits in the market place. An example of the reason why this is important is in our plant in Korea, we gained \$9.5M from the sale of carbon credits as well as reducing our carbon footprint.

Implementing energy efficiency in GM operations in Korea began with an energy treasure hunt in early 2017 and ended with the implementation of various initiatives - LED lights, compressed air and building management. These initiatives represent an opportunity for us to reduce our operational costs and to sell carbon credits into the Korean Carbon Emission Trading Scheme. In 2018, GM Korea continued to make efficiency improvements and sold 464,884 tons at \$20.44 for a revenue of \$9.5M USD

## C11.2

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

No

## C11.3

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

Yes

### C11.3a

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

**Objective for implementing an internal carbon price**

Drive energy efficiency  
Drive low-carbon investment  
Identify and seize low-carbon opportunities

**GHG Scope**

Scope 1  
Scope 2

**Application**

Energy efficiency projects usually provide a return on investment within 2 years. Adding the value of carbon credits to the savings provides for quicker payback and allows additional projects to be implemented within the targeted return. An example of this was in our facilities in South Korea where energy project business cases included carbon credits to enhance the returns. In reality, GM Korea was able to sell 464,684 CO<sub>2</sub>e tons at \$9.5 M USD into the market at a price of \$20/ton, yielding \$9.5M USD. An example of prioritization is for two energy saving LED projects with similar paybacks, one in US and one in Canada, would be prioritized by added benefit of more CO<sub>2</sub>e savings in US due to higher emission factors. Additionally, we developed a plan to include a price on carbon in our energy efficiency and carbon reduction project prioritization process. This will provide reducing carbon as a top priority for implementing projects.

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

25

**Variance of price(s) used**

We have not used an estimated variance in price on carbon yet, as real market data is easiest to sell to management as indicative of current market conditions. We are expanding this to other regions and have started using a shadow price to prioritize energy and carbon efficiency projects in North America.

**Type of internal carbon price**

Shadow price

**Impact & implication**

Using a price on carbon provides a number of advantages including greater awareness of the value of carbon reduction, prioritization of projects that favors carbon reduction, and an increase in project spend available in regions where cap and trade is in effect as experienced in our facility in Korea where we sold credits to the market.

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## C12. Engagement

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### C12.1

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

Yes, our suppliers  
Yes, our customers

**C12.1a**

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

**Type of engagement**

Information collection (understanding supplier behavior)

**Details of engagement**

Collect climate change and carbon information at least annually from suppliers

**% of suppliers by number**

2

**% total procurement spend (direct and indirect)**

56

**% Scope 3 emissions as reported in C6.5**

17

**Rationale for the coverage of your engagement**

General Motors' sustainability strategy is synonymous with its business strategy. Our vision for personal mobility is a world with zero crashes, zero emissions and zero congestion. By delivering safer, simpler and sustainable transportation solutions for our customers, we'll realize that vision. In the process, our goal is for GM to become the most valued automotive company. In order to build the most valuable automotive company, we must recognize that our impacts go beyond the walls of GM to include our entire value chain, of which customers and suppliers make up a significant part. The importance of strong supply chain management and relationships is further underscored as new issues arise due to business expansion into emerging markets and increased participation in more advanced technologies, such as electricity-powered vehicles. We seek to partner with suppliers who share our purpose and values. We expect our employees who work with suppliers to hold them accountable to the same environmental principles and ethical standards to which we hold our own employees and operations—so we all win with integrity. Engagement with suppliers to reduce GHG in auto parts life-cycle is an enormous task that needs prioritization. We use life cycle analysis (LCA) of GHG for each supplier to determine the impact on our Scope 3 emissions and include the top emitters that are mostly in the top spend group also. GM participates with CDP Supply Chain in Climate Change and Water and we asked about 310 suppliers comprised of the majority of spend at 56% and large GHG emitters groups to engage in 2018. We use CDP Supply Chain GHG data to calibrate our LCA emissions for auto parts and to engage with them on collaboration to reduce the effects of Climate Change.

**Impact of engagement, including measures of success**

The number of suppliers responding to CDP Climate Change increased by 4% in 2018 with the assistance of CDP Supply Chain and internal resources. Measuring our supply chain's disclosure and performance related to Climate Change shows increased governance, emissions reporting, Suppliers engaging with their suppliers, increase in number of Suppliers reporting a target from 95 to 135, and 30 Suppliers reporting a renewable energy target. It is encouraging to see our suppliers engaged in Science based targets with 38% having an approved one or anticipating an SBTi within the next two years. A total of 13% have Renewable energy targets with 3% that have committed to RE-100, similar to GM. Twenty percentage of suppliers responding have proposed collaborative opportunities with GM. We have already engaged with one on reducing the impact on forests with the development of an airless tire. GM suppliers reported reduction of over 27 million tons of GHG with energy efficiency and conservation efforts that amounted to \$1.4B USD in savings. Allocating to GM resulted in 540,000 tons avoided and \$28 Million USD savings. Twenty-six suppliers are interested in Action Exchange and 2% reported reduction in emissions based on engagement with GM. GM measures success in supply chain engagement on Climate Change by measuring year over year continuous improvement (CI), here are the important results for 2018 vs. 2017: - Suppliers reporting to CDP based on investor request increased by 23% - Suppliers reporting targets increased 13% -Scope 1 emissions reporting increased by 6% -GHG Emissions reduction activities in tons GHG reduced increased by 20% GM's expectation for CI is 5% improvement for important aspects of supply chain engagement in Climate Change as shown above. - Interest in Action Exchange increased by 36%

**Comment**

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**C12.1b**

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

**Type of engagement**

Collaboration & innovation

**Details of engagement**

Other – please provide information in column 5

**% of customers by number**

7

**% Scope 3 emissions as reported in C6.5**

0.4

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

GM is committed to a world with Zero emissions and is selling BEV that emit lower carbon emissions than internal combustion engines. We had sales of over 66 thousand BEV in 2018 demonstrating that some of our customers support a lower carbon economy. The scope of engagement is to sell electric vehicles and support the development of EV infrastructure to increase EV sales. GM's collaboration effort toward an all-electric future is our proposed National Zero Emission Vehicle (NZEV) program. Under the plan we have submitted, manufacturers would need to meet steadily increasing targets for electrifying a portion of their light-duty vehicle fleets. In addition, we support further dialogue on continued EV research, EV infrastructure investment and federal incentives. The program could put more than 7 million long-range EVs on the road while reducing CO2 emissions by 375 million tons over current levels between 2021 and 2030. A 10% market penetration for GM would mean targeting 7% of our customers for EV sales in the near future.

**Impact of engagement, including measures of success**

Success with the collaboration is measured by continuous improvement (CI) in EV development and sales. In 2018, we introduced two new all-electric vehicles in China, based on what we have learned from developing the Chevrolet Bolt EV: the Buick Velite 6 EV and the Baojun E200. China is the world's largest EV market, and a major driver of EV adoption. To support our growing EV portfolio, last fall we invested \$28 million in our battery lab at our Global Technical Center in Warren, Michigan, where we conduct nearly all battery testing to reduce development time and cost. The investment funded new test chambers and advanced equipment that will help us accelerate our next-generation battery architecture. We continue to build lithium-ion batteries at our Brownstown Battery Assembly Plant. Where it makes sense, we work with like-minded partners to bring EVs to market more quickly. In 2018, we announced a partnership with Honda to collaborate on advanced chemistry battery components, with Honda ultimately sourcing battery modules from General Motors. Our combined scale and manufacturing efficiencies will help each of us accelerate our EV programs. Also as EV infrastructure is an enabler to increasing sales, GM announced its intentions to collaborate with EVgo, ChargePoint, and GreenLots — three of the nation's leading EV charging networks — to give our EV customers access to more than 31,000 charging ports, data about charge station availability and compatibility, and other real-time, data-driven features through the myChevrolet app. These CI measures demonstrate advancing collaboration toward an all EV future for automobiles. Another measure of success is demonstrated by increased sales of BEVs. Increased sales of GM electrified vehicles grew 5% in 2018 to 115,379 vehicles compared to 2017 showing an increased interest in a low carbon economy and incremental success.

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**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
- Other

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**C12.3a**

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

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Other, please specify (Increase access to electric charging)	Support	GM joined 45 auto-industry peers as signatories to the Guiding Principles to Promote Electric Vehicles and Charging Infrastructure, a commitment to the collaboration between the government and industry to increase consumer access to electric vehicles and charging infrastructure all across the US. This engagement deepens the partnerships and collaborative relationships that are needed to successfully drive nationwide EV adoption into the mainstream and focuses on strategizing EV infrastructure, regulatory, and policy enablers at the state and federal level.	One example of GM support included Pacific Gas & Electric Company's application before the Public Utilities Commission of the State of California to install infrastructure to support electric vehicle charging at multi-unit dwellings, workplaces, and public interest destinations. In its application, PG&E will convene a program advisory council comprised of representatives from state agencies, ratepayer advocates, environmental justice groups, technology providers, automakers, and others to provide feedback and guidance on pilot design and implementation.
Other, please specify (National Zero Emission Vehicle)	Support	Another step toward an all-electric future is our proposed National Zero Emission Vehicle (NZEV) program. It is a comprehensive approach to help move the U.S. faster toward zero emissions, while encouraging American innovation and preserving the country's industrial strength.	Under the plan we have submitted, manufacturers would need to meet steadily increasing targets for electrifying a portion of their light-duty vehicle fleets. In addition, we support further dialogue on continued EV research, EV infrastructure investment, and federal incentives. The program could put more than 7 million long-range EVs on the road while reducing CO2 emissions by 375 million tons over current levels between 2021 and 2030.

**C12.3b**

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

Yes

**C12.3c**

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

**Trade association**

The Alliance of Automobile Manufacturers (Auto Alliance) position on climate change is that reducing transportation sector greenhouse gas emissions will require the mass market commercialization of electric vehicles. That includes technologies such as hybrid electrics, plug-in hybrid electrics, battery electrics, and fuel cell vehicles. Widespread consumer acceptance of these technologies will require that efforts be focused on important considerations such as: supporting infrastructure, incentives for consumer adoption, the alignment of regulatory efforts and the removal of market barriers. One example of how the Auto Alliance has attempted to influence climate change policy is through the issuance of statements on behalf of its members. The Auto Alliance has called for a single, national program because conflicting requirements from several regulatory bodies raise costs, ultimately losing value to consumers.

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

The Alliance of Automobile Manufacturers (Auto Alliance) position on climate change that reducing transportation sector greenhouse gas emissions will require the mass market commercialization of electric vehicles. That includes technologies such as hybrid electrics, plug-in hybrid electrics, battery electrics, and fuel cell vehicles. Widespread consumer acceptance of these technologies will require that efforts be focused on important considerations such as: supporting infrastructure, incentives for consumer adoption, the alignment of regulatory efforts and the removal of market barriers. One example of how the Auto Alliance has attempted to influence climate change policy is through the issuance of statements on behalf of its members. The Auto Alliance has called for a single, national program because conflicting requirements from several regulatory bodies raise costs, ultimately taking money out of consumers' pockets and hurting sales. We all want to get more fuel-efficient autos on our roads, and a single, national program with a strong midterm review helps us get closer to that shared goal.

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

GM is an active supporter of Alliance of Automobile Manufacturers (Auto Alliance). GM's position is consistent with the Auto Alliance position so there is no need to influence the position.

## C12.3e

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### **(C12.3e) Provide details of the other engagement activities that you undertake.**

GM was a founding signatory for the Renewable Energy Buyer's Alliance (REBA) and a founding member of REBA, along with the Business Renewables Center. GM is an active member of Solar Energy Industry Association (SEIA) and American Wind Energy Association (AWEA).

In early 2019, GM partnered with Google, Facebook, Walmart, and more than 300 other companies to launch REBA as a standalone entity—the largest group of corporate renewable energy buyers in the United States. By working to unlock the marketplace for organizations to buy renewable energy, REBA hopes to bring more than 60 gigawatts (GW) of new renewables online in the

U.S. by 2025. The new association will function as a membership organization spanning diverse industries and business types, and whose leadership circle alone represents annual revenues of \$1 trillion, millions of jobs and more than 1 percent of U.S. annual electricity consumption (48 terawatt-hours).

## C12.3f

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### **(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?**

GM's Global Public Policy (GPP) group is responsible for ensuring that all of our direct (e.g.: government relations) and indirect activities (e.g.: membership in various organizations) that influence climate change policy are consistent with the Company's climate change strategy. The GPP has four primary business processes in place to ensure consistency between our actions and strategy:

- 1) Policy position development process
- 2) GM Political Action Committee candidate selection process
- 3) Strategic External Stakeholder Engagement process
- 4) GM Corporate Giving & Global Philanthropy budget and grant approval process

Overseeing the first three processes and supporting the fourth process is the GPP leadership team which includes GM's Senior Vice President of Global Public Policy and direct reports. GM's Senior Vice President of Global Public Policy is on GM's Executive Leadership Team, GM's most senior management body which includes the CEO, CFO, and President. Regular weekly and monthly meetings have been established to review, analyse, debate, and decide on positions and partnerships to ensure consistency between the Company's strategy, action, and position on climate change. GM's vice president of global government relations and GM's vice president of GM North America Public Policy play a key role in ensuring day-to-day consistency between our actions and strategy. Furthermore, Senior Vice President of Global Public Policy and direct reports support in a variety of ways the review and approval of organizations that receive funding primarily along the areas of STEM, Safety, and Sustainable Communities. GM's Corporate Giving and Global Philanthropy also provides funding to address energy and environmental issues. Therefore, organizations addressing climate change such as the World Wildlife Fund are recipients of philanthropic grants. An example of aligning process with climate change strategy is GM's recent contribution to the WWF in support of science-based targets and renewable energy. GM belongs to numerous organizations that take positions on many issues. It is not uncommon that an organization may take a different position than GM. In regard to climate change, GM makes public its position on climate to ensure there is no confusion on where GM stands. However, GM may consider leaving an organization as it did when GM decided to no longer provide funding to the Heartland Institute and American Legislative Exchange Council due to their positions against addressing climate change.

## C12.4

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

**Publication**

In mainstream reports, incorporating the TCFD recommendations

**Status**

Complete

**Attach the document**

1

GM 10k 2019.pdf

**Page/Section reference**

Page 3, last paragraph, Page 5, paragraph 8, Page 6, last paragraph, Page 5, paragraph 6, Page 15, paragraph 1.

**Content elements**

Strategy

Other, please specify

**Comment**

Business: Research, Product and Business Development and Intellectual Property (pages 3-5); Environmental and Regulatory Matters (pages 5-8); Item 1A. Risk Factors (pages 10-16)

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**Publication**

In voluntary sustainability report

**Status**

Complete

**Attach the document**

2

GM\_2018\_SR.pdf

**Page/Section reference**

Governance - page 121, entire page, page 126- Plan for Global Warming Scenarios Strategy - page 126, last paragraph Risks and Opportunities - page 126, first paragraph, page 184, 4th paragraph, page 187, page 190, entire page Emission figures and targets - page 138, entire page Metrics - pages 165-166, GRI index

**Content elements**

Governance

Strategy

Risks & opportunities

Emissions figures

Emission targets

Other metrics

**Comment**

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**C14. Signoff**

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**C-FI**

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**(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**

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