# **PACCAR Inc - Climate Change 2018**

## **C0. Introduction**

## **C0.1**

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

PACCAR is a global technology leader in the design, manufacture and customer support of premium light-, medium- and heavy-duty trucks under the Kenworth, Peterbilt and DAF nameplates. The company also provides customized financial services, information technology and truck parts related to its principal business.

## **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 2017 | December 31 2017 | No | <Not Applicable> |
| Row 2 | <Not Applicable> | <Not Applicable> | <Not Applicable> | <Not Applicable> |
| Row 3 | <Not Applicable> | <Not Applicable> | <Not Applicable> | <Not Applicable> |
| Row 4 | <Not Applicable> | <Not Applicable> | <Not Applicable> | <Not Applicable> |

## **C0.3**

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

Australia

Belgium

Canada

Mexico

Netherlands

United Kingdom of Great Britain and Northern Ireland

United States of America

Other, please specify (Rest of world)

## **C0.4**

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

USD

## **C0.5**

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

Operational control

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

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

Heavy Duty Vehicles (HDV)

## **C1. Governance**

## **C1.1**

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

Yes

## **C1.1a**

### **(C1.1a) Identify the position(s) of the individual(s) on the board with responsibility for climate-related issues.**

|  |  |
| --- | --- |
| **Position of individual(s)** | **Please explain** |
| Chief Executive Officer (CEO) | PACCAR’s Chief Executive Officer, who is a member of the Board of Directors, has direct responsibility for climate-related issues. This is because climate strategy and action are integrated into PACCAR’s operations, planning, capital budgeting processes, which are the responsibility of the CEO. The senior executives in charge of division operations, planning, strategy, and innovation report directly to the CEO on a weekly basis. For example, significant progress with advanced technology vehicles including hybrids, alternative low carbon fueled and electric vehicles is reported to the CEO on a weekly basis by PACCAR’s Chief Technology Officer, Kyle Quinn. The CTO’s focus is on electrification and connected vehicles, hybrid vehicles, low carbon fuels and fuel cell technology for commercial freight applications. The CTO also reports progress and strategies for advanced vehicles to the Board of Directors at each Board Meeting. |

## **C1.1b**

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

|  |  |  |
| --- | --- | --- |
| **Frequency with which climate-related issues are a scheduled agenda item** | **Governance mechanisms into which climate-related issues are integrated** | **Please explain** |
| Scheduled – all meetings | Reviewing and guiding strategy  Reviewing and guiding major plans of action  Reviewing and guiding business plans | Advanced vehicle technology such as hybrids, alternative low carbon fuels and electric vehicles is an agenda topic at each Board meeting including climate-related issues. |
| Other, please specify (Every other year) | Monitoring and overseeing progress against goals and targets for addressing climate-related issues | Product use related greenhouse gas emissions regulations and goals are discussed every two years during the Board level business strategy reviews. |
| Sporadic - as important matters arise | Monitoring and overseeing progress against goals and targets for addressing climate-related issues | Board level presentation of facility related greenhouse gas emissions and goals is scheduled as needed. |

## **C1.2**

### **(C1.2) Below board-level, provide the highest-level management 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 (Chief Technology Officer) | Both assessing and managing climate-related risks and opportunities | 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.**

PACCAR’s Chief Technology Officer, Kyle Quinn, reports directly to the President of PACCAR who reports to the CEO. The CTO is responsible for PACCAR’s global information technology, innovation and technical centers in Silicon Valley and Washington State, and PACCAR’s Engine and Powertrain groups. The CTO is responsible for PACCAR’s advancement in electrification and connected vehicles, hybrid vehicles, low carbons fuels and fuel cell technology for commercial freight applications. This makes the CTO uniquely qualified to lead PACCAR’s climate-related program for next generation products including strategy and planning for low carbon transitioning, scenario analysis and product-use greenhouse gas emissions goals. The CTO reports progress and strategies for advanced vehicles to the Board of Directors at each Board meeting including climate-related issues and progress. In addition, the CTO reports significant progress with advanced technology vehicles such as hybrids, alternative low carbon fueled and electric vehicles to the CEO on a weekly basis including progress in climate-related issues.

## **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.**

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

Corporate executive team

### **Types of incentives**

Monetary reward

### **Activity incentivized**

Emissions reduction project

### **Comment**

Executive bonuses are based on attainment of goals which include reduction of energy use, reduction of facility greenhouse gas emissions, development of strategy and business plans to reduce greenhouse gas emissions from facilities and product use.

## **C2. Risks and opportunities**

## **C2.1**

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

|  |  |  |  |
| --- | --- | --- | --- |
|  | **From (years)** | **To (years)** | **Comment** |
| Short-term | 0 | 3 |  |
| Medium-term | 4 | 10 |  |
| Long-term | 11 | 30 |  |

## **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 | Product related risks and opportunities related to advance vehicle technology such as vehicle electrification and low carbon fuels are evaluated globally and reported to the Board of Directors quarterly. |

## **C2.2b**

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

PACCAR utilizes an integrated multi-disciplinary company-wide risk identification and assessment process, which is reviewed every six months and considers short, medium and long-term time (greater than 6-years) horizons. As an example, product related risks are identified on a global basis by experienced internal management at semi-annual meetings, and through external stakeholder engagement including frequent collaborations with partners, suppliers, government agencies and customers to identify risks from increasing regulations, changing customer preferences, new disruptive technology and public policy support for low carbon transportation infrastructure such as vehicle electrification and low carbon fuels. Product or transition related risks are identified and evaluated globally, and reported to the Board of Directors quarterly. Company-level identification and evaluation of physical climate related risks is multi-pronged. One prong is the annual development of company-wide business continuity plans designed to mitigate material risks including severe weather impacts such as floods and windstorms. PACCAR also periodically engages third party auditors to evaluate risks at individual facilities resulting in company level planning for such events as supply chain interruptions due to climate related severe weather patterns. PACCAR also performs quarterly financial evaluation of all regulatory and legal risks including those related to climate change. External auditors evaluate the quarterly review of risks. Asset level evaluation of risks due to changing greenhouse gas emissions regulations, cost reduction including energy expenses and weather related interruptions is conducted as part of business continuity planning, PACCAR's Six Sigma program, ISO14001 audits, both internal and external and third party reviews. Evaluation of climate related risks includes determination of the magnitude of the financial risk. The significance of the financial impact of identified risks including climate-related risk is based on probabilities of both the likelihood of occurrence and potential financial impacts, and the materiality and estimability of probable risks in accordance with generally accepted accounting practices. The financial impact of climate-related risk is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects.

## **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 | Regulatory risks are identified and assessed on a global basis by experienced internal management at semi-annual meetings, and through external stakeholder engagement including frequent collaborations with partners, suppliers, government agencies and customers to identify risks from increasing regulations, changing customer preferences, new disruptive technology and public policy support for low carbon transportation infrastructure such as vehicle electrification and low carbon fuels. Product or transition related risks including regulations are identified and evaluated globally, and reported to the Board of Directors quarterly. Evaluation of regulatory risks includes determination of the magnitude of the financial risk. The significance of the financial impact of identified risks including climate-related risk is based on probabilities of both the likelihood of occurrence and potential financial impacts, and the materiality and estimability of probable risks in accordance with generally accepted accounting practices. The financial impact of climate-related risk is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects. For example, product level regulation by EPA of greenhouse gas emissions from PACCAR’s nameplate Kenworth and Peterbilt heavy duty vehicles (see Federal Register Vol 76 No 179) sold in the U.S. is of strategic importance to PACCAR in the development of vehicles and in providing customers with operationally efficient and compliant trucks. |
| Emerging regulation | Relevant, always included | Regulatory risks are identified and assessed on a global basis by experienced internal management at semi-annual meetings, and through external stakeholder engagement including frequent collaborations with partners, suppliers, government agencies and customers to identify risks from increasing regulations, changing customer preferences, new disruptive technology and public policy support for low carbon transportation infrastructure such as vehicle electrification and low carbon fuels. Product or transition related risks including emerging regulations are identified and evaluated globally, and reported to the Board of Directors quarterly. Evaluation of regulatory risks includes determination of the magnitude of the financial risk. The significance of the financial impact of identified risks including climate-related risk is based on probabilities of both the likelihood of occurrence and potential financial impacts, and the materiality and estimability of probable risks in accordance with generally accepted accounting practices. The financial impact of climate-related risk is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects. PACCAR participates in industry groups and collaborates directly with government agencies to track and help craft regulations related to road freight and manufacturing operations. For example, two of PACCAR’s nameplates, Kenworth and Peterbilt, collaborated with the Port of Long Beach California, Transpower and the California Air Resources Control Board to develop all electric models to meet potential new requirements for zero emissions port logistics. |
| Technology | Relevant, always included | Technology risks are identified and assessed on a global basis by experienced internal management at semi-annual meetings, and through external stakeholder engagement including frequent collaborations with partners, suppliers, government agencies and customers to identify risks from increasing regulations, changing customer preferences, new disruptive technology and public policy support for low carbon transportation infrastructure such as vehicle electrification and low carbon fuels. Product or transition related risks including new technology are identified and evaluated globally, and reported to the Board of Directors quarterly. Evaluation of technology risks includes determination of the magnitude of the financial risk. The significance of the financial impact of identified risks including climate-related risk is based on probabilities of both the likelihood of occurrence and potential financial impacts, and the materiality and estimability of probable risks in accordance with generally accepted accounting practices. The financial impact of climate-related risk is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects. For example, PACCAR's goal is to provide our customers with the most technologically advanced vehicles, such as PACCAR’s nameplate DAF new CF and XF models with highly efficient transmissions and rear axles. Along with a new compact after-treatment system, sophisticated software and aerodynamic optimization, the new DAF CF and XF models reduce fuel consumption and CO2 emissions by 7% compared with previous year models. The new DAF CF and XF models reduce customer operating costs and impacts of operations including reduced fuel costs, lower environmental impacts freight transport through reduced emissions including greenhouse gas emissions. |
| Legal | Relevant, always included | PACCAR's core values include legal compliance in all aspects of the business. Legal risks are identified and assessed on a global basis by experienced internal management at semi-annual meetings, and through external stakeholder engagement including frequent collaborations with partners, suppliers, government agencies and customers to identify risks from increasing laws and regulations, changing customer preferences, new disruptive technology and public policy support for low carbon transportation infrastructure such as vehicle electrification and low carbon fuels. Product or transition related risks including legal compliance are identified and evaluated globally, and reported to the Board of Directors quarterly. Evaluation of regulatory risks includes determination of the magnitude of the financial risk. The significance of the financial impact of identified risks including climate-related risk is based on probabilities of both the likelihood of occurrence and potential financial impacts, and the materiality and estimability of probable risks in accordance with generally accepted accounting practices. The financial impact of climate-related risk is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects. For example, legal compliance with product related regulations by EPA of greenhouse gas emissions from PACCAR’s nameplate Kenworth and Peterbilt heavy duty vehicles (see Federal Register Vol 76 No 179) sold in the U.S. is of strategic importance to PACCAR in the development of vehicles and in providing customers with operationally efficient and compliant trucks. Facility compliance with applicable emissions laws and regulations including greenhouse gas emissions trading and taxation is both a cost of doing business and an opportunity to reduce costs. Legal compliance is a part of strategic planning related to advance vehicle technology and facility operations. |
| Market | Relevant, always included | PACCAR's goal is to increase market share by providing customers with industry leading trucks with reduced operating costs and lower environmental impacts including emissions. Market risks are identified and assessed on a global basis by experienced internal management at semi-annual meetings, and through external stakeholder engagement including frequent collaborations with partners, suppliers, government agencies and customers to identify risks from increasing regulations, changing customer preferences, new disruptive technology and public policy support for low carbon transportation infrastructure such as vehicle electrification and low carbon fuels. Product or transition related market risks are identified and evaluated globally, and reported to the Board of Directors quarterly. Evaluation of market risks includes determination of the magnitude of the financial risk. The significance of the financial impact of identified risks including climate-related risk is based on probabilities of both the likelihood of occurrence and potential financial impacts, and the materiality and estimability of probable risks in accordance with generally accepted accounting practices. The financial impact of climate-related risk is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects. For example, PACCAR's goal is to increase market share by providing our customers with the most technologically advanced vehicles, such as PACCAR’s nameplate DAF new CF and XF models with highly efficient transmissions and rear axles. Along with a new compact after-treatment system, sophisticated software and aerodynamic optimization, the new DAF CF and XF models reduce fuel consumption and CO2 emissions by 7% compared with previous year models. The new DAF CF and XF models reduce customer operating costs and impacts of operations including reduced fuel costs, lower environmental impacts freight transport through reduced emissions including greenhouse gas emissions. |
| Reputation | Relevant, always included | Reputational risks are identified and assessed on a global basis by experienced internal management at semi-annual meetings, and through external stakeholder engagement including frequent collaborations with partners, suppliers, government agencies and customers to identify risks from stakeholder opinion of PACCAR’s reputation, increasing regulations, changing customer preferences, new disruptive technology and public policy support for low carbon transportation infrastructure such as vehicle electrification and low carbon fuels. Product or transition related reputational risks are identified and evaluated globally, and reported to the Board of Directors quarterly. Evaluation of reputational risks includes determination of the magnitude of the financial risk. The significance of the financial impact of identified risks including climate-related risk is based on probabilities of both the likelihood of occurrence and potential financial impacts, and the materiality and estimability of probable risks in accordance with generally accepted accounting practices. The financial impact of climate-related risk is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects. For example, PACCAR’s reputation for quality, advanced vehicles with lower operating costs and lower environmental impacts was enhanced in 2017 with the introduction of PACCAR’s nameplate DAF new CF and XF models with highly efficient transmissions and rear axles. Along with a new compact after-treatment system, sophisticated software and aerodynamic optimization, the new DAF CF and XF models reduce fuel consumption and CO2 emissions by 7% compared with previous year models. The new DAF CF and XF models reduce customer operating costs and impacts of operations including reduced fuel costs, lower environmental impacts freight transport through reduced emissions including greenhouse gas emissions. |
| Acute physical | Relevant, always included | Extreme weather events can cause power outages, floods, landslides, and damage facility and transportation infrastructure such as buildings, roads, bridges and rail tracks. The risk is that power outages, facility and infrastructure damage from extreme weather events such as tornadoes and flooding can immediately disrupt PACCAR's operations, as well as PACCAR’s suppliers and customers. One example of acute physical risks for PACCAR is the risk of a tornado at the PACCAR Parts Distribution Center in Oklahoma City, Oklahoma. Tornado damage could disrupt operations at the PACCAR Parts Distribution Center in Oklahoma City, Oklahoma. Weather and infrastructure related risks including acute physical risks, such as tornadoes, are identified and assessed on a global basis through PACCAR’s annual business continuity evaluation and planning process. Also, third party reviews of physical risks to PACCAR facilities is performed annually. Evaluation of acute physical risks includes determination of the magnitude of the financial risk. The significance of the financial impact of identified risks including climate-related risk is based on probabilities of both the likelihood of occurrence and potential financial impacts, and the materiality and estimability of probable risks in accordance with generally accepted accounting practices. The financial impact of climate-related risk is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects. |
| Chronic physical | Relevant, sometimes included | Weather and infrastructure related risks including chronic physical risks are identified and assessed on a global basis through PACCAR’s annual business continuity evaluation and planning process. Also, third party reviews of physical risks to PACCAR facilities is performed annually. Evaluation of chronic physical risks includes determination of the magnitude of the financial risk. The significance of the financial impact of identified risks including climate-related risk is based on probabilities of both the likelihood of occurrence and potential financial impacts, and the materiality and estimability of probable risks in accordance with generally accepted accounting practices. The financial impact of climate-related risk is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects. For example, one of PACCAR’s chronic physical risks includes a rise in sea levels over the next century, which could impact the structure and disrupt operations of our largest manufacturing plant located in Eindhoven, Netherlands. |
| Upstream | Relevant, always included | The upstream supply chain risks include the willingness and ability of PACCAR’s current and future suppliers to collaborate. Supply chain risks are identified and assessed on a global basis by experienced internal management at semi-annual meetings, and through external stakeholder engagement including frequent collaborations with partners, suppliers, government agencies and customers to identify risks from increasing regulations, changing customer preferences, new disruptive technology and public policy support for low carbon transportation infrastructure such as vehicle electrification and low carbon fuels. Supply chain risks are identified and evaluated globally, and reported to the Board of Directors quarterly. Evaluation of supply chain risks includes determination of the magnitude of the financial risk. The significance of the financial impact of identified risks including climate-related risk is based on probabilities of both the likelihood of occurrence and potential financial impacts, and the materiality and estimability of probable risks in accordance with generally accepted accounting practices. The financial impact of climate-related risk is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects. Supply chain collaboration to develop advance vehicle technology is a key part of PACCAR's strategy to meet or exceed regulatory requirements and customer expectations for improved fuel economy, alternative, lower carbon fuels and future logistics ready improvements. For example, the willingness and ability for supplier Cummins to collaborate with PACCAR and BAE Systems in 2017 resulted in development of a prototype Kenworth, which is a PACCAR nameplate, T680 natural gas powered hybrid-electric truck, which achieves a 30-mile zero-emissions range using lithium-ion batteries. When the batteries are depleted, the near-zero emissions natural gas engine turns on to generate more energy to extend the truck’s range up to 250 miles. |
| Downstream | Relevant, always included | The downstream risks of not meeting customer expectations for advanced road freight vehicles that will help them meet their sustainability goals are identified and assessed on a global basis by experienced internal management at semi-annual meetings, and through external stakeholder engagement including frequent collaborations with partners, suppliers, government agencies and customers to identify risks from increasing regulations, changing customer preferences, new disruptive technology and public policy support for low carbon transportation infrastructure such as vehicle electrification and low carbon fuels. . For example, PACCAR’s nameplate Kenworth Division is collaborating with UPS as part of the DOE SuperTruck II project. The project will utilize Kenworth’s T680 highway flagship tractor and the fuel-efficient PACCAR MX engine. The project target goals include the demonstration of greater than 100 percent improvement in freight efficiency over the 2009 equivalent model and achieving 55 percent engine brake thermal efficiency. This initiative supports UPS’s sustainability commitment to reduce absolute greenhouse gas emissions from global operations by 12 percent by 2025. Risks related to customer expectations are identified and evaluated globally, and reported to the Board of Directors quarterly. Evaluation of risks related to customer expectation includes determination of the magnitude of the financial risk. The significance of the financial impact of identified risks including climate-related risk is based on probabilities of both the likelihood of occurrence and potential financial impacts, and the materiality and estimability of probable risks in accordance with generally accepted accounting practices. The financial impact of climate-related risk is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects. |

## **C2.2d**

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

PACCAR utilizes an integrated multi-disciplinary company-wide risk and opportunity management process, which is reviewed every six months and considers short, medium and long-term (greater than 6-years) time horizons. PACCAR’s management of physical and transition risks and opportunities is multi-pronged. One prong is the annual development of company-wide business continuity plans. Other prongs include PACCAR’s due diligence process for acquisitions and real estate investments, quarterly financial reporting process and regulatory reviews. The final prong is PACCAR’s strategic planning process. PACCAR’s strategic planning process continuously gathers market intelligence through stakeholder feedback. Stakeholders include customers, suppliers, peers, investors, non-governmental agencies, government agencies, and employees. The resulting market intelligence, financial evaluations, due diligence results, regulatory findings, and business continuity plans are discussed during quarterly strategic planning meetings and semi-annual company-wide meetings. Priorities are determined during PACCAR’s strategic reviews and inform the company-wide allocation of funding for capital investments, facility and division operating budgets, as well as research and development. Next steps include development and testing of new products concepts, followed by marketing plans and investments in manufacturing readiness. Improvements are also made to operational flexibility to address physical risks and opportunities. An example of PACCAR’s process for managing transition opportunities related to shifting customer preferences through continuous stakeholder engagement is PACCAR's new advanced vehicle technology program. Headquartered in Silicon Valley, California, PACCAR’s advance vehicle technology group is collaborating with both new and long-term suppliers and customers to develop the next generation of low carbon vehicles with improved fuel economy, improved operational efficiency and low/no emissions including electrification of commercial road freight. An example of PACCAR’s process for managing transition risks from changing regulations starts with quarterly reviews of all regulatory and legal risks including product related emissions regulations. PACCAR’s knowledge of the details of regulation of greenhouse gas emissions of heavy-duty vehicles in the US and Canada, strategic preparation for new product development, successful marketing approach and timely execution of manufacturing of compliant vehicles resulted in PACCAR’s record market share in 2017 while also exceeding the greenhouse gas emissions reductions requirements. PACCAR’s success resulted not only in CO2 credits in 2017 but also in allowing CO2 credits to expire without needing to use them, a win-win for PACCAR and the environment. An example of PACCAR's approach to managing physical risks through the due diligence process for property acquisition is a recent acquisition of land in Texas. The site that was above flood plains and without drainage challenges was selected over the alternative site, which included both flood plains and drainage issues to avoid flooding and storm surge related damage and business disruption. As a result of Business Continuity Planning, PACCAR’s process for managing physical opportunities to increase revenue through business resiliency in response to extreme weather damage includes equipping geographically dispersed PACCAR facilities to provide operational backup whenever needed. In addition, arrangements are made in advance of business disruptions to reroute supplier and customer deliveries through other locations, and directly from suppliers to customers as needed to maximize revenues. PACCAR also continually invests in improved remote networking capability to enable PACCAR personnel to manage operations from remote locations. As a result, in the event of tornado damage and operational disruption to PACCAR Parts Distribution Center in Oklahoma City, supplier and customer deliveries are immediately rerouted through other locations, such as the Atlanta Parts Distribution Center or directly from suppliers to customers. If needed, PACCAR personnel can manage logistics, supplier coordination and customer support remotely to seamlessly respond to customer parts orders in accordance with business continuity and strategic plans.

## **C2.3**

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

Yes

## **C2.3a**

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

### **Identifier**

Risk 1

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

Direct operations

### **Risk type**

Physical risk

### **Primary climate-related risk driver**

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

### **Type of financial impact driver**

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

### **Company- specific description**

Extreme weather events can cause power outages, floods, landslides, and damage facility and transportation infrastructure such as buildings, roads, bridges and rail tracks. The risk is that power outages, facility and infrastructure damage from extreme weather events such as tornadoes and flooding can immediately disrupt PACCAR's operations, as well as PACCAR’s suppliers and customers. For example, a tornado could disrupt operations at the PACCAR Parts distribution center in Oklahoma City, Oklahoma.

### **Time horizon**

Short-term

### **Likelihood**

Unlikely

### **Magnitude of impact**

Medium

### **Potential financial impact**

184000000

### **Explanation of financial impact**

The financial impact of climate-related physical risk is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects. The potential financial implication depends upon the duration of the interruption of operations at the Parts Distribution Center in Oklahoma City. For example, a year-long reduction of capacity of one PACCAR Parts Distribution such as PACCAR’s Oklahoma City facility due to tornado damage could reduce revenue by 1/18th of the PACCAR Parts revenue in 2017 or $184 million if insurance did not cover the losses. There were 18 global PACCAR Parts facilities globally generating $3,327 million in 2017, which calculates to $184,000,000 per facility and is a substantive financial impact.

### **Management method**

Weather and infrastructure related risks are managed through PACCAR’s annual business continuity evaluation and planning process. Also, third party reviews of physical risks to PACCAR’s facilities is performed annually. Operational decisions are made to reduce the risk of impacts from extreme weather events. For example, PACCAR's operations are geographically diverse allowing production and parts sales to be shifted to other facilities as needed. PACCAR is also insured for weather related losses.

### **Cost of management**

10800000

### **Comment**

Costs for management of weather related risks is part of PACCAR's standard operating costs. For comparison with risks, PACCAR Parts Selling, General and Administrative (SGandA) costs in 2017 were $195 million, a small part of which was related to managing operational risks of weather related losses. Costs applicable to managing risks at the Oklahoma City distribution center are calculated by dividing the annual costs for PACCAR Parts by 18, which is the number of PACCAR Parts facilities worldwide or $10,800,000 per facility.

### **Identifier**

Risk 2

### **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 driver**

Policy and legal: Increased costs and/or reduced demand for products and services resulting from fines and judgments

### **Company- specific description**

New regulations such as the U.S. EPA's Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium and Heavy Duty Engines and Vehicles as found in Federal Register vol 78 No 116 require PACCAR to improve fuel efficiency and reduce greenhouse gas emissions from the commercial vehicles and engines sold in the US. Canada has similar regulations. The risk for PACCAR is the potential increased costs due to fines if Kenworth and Peterbilt vehicles and engines are not compliant with greenhouse gas regulatory standards in the U.S. As an example, improvements were made to Peterbilt’s new Model 579 to not only meet but exceed the greenhouse gas emissions standards in 2017 resulting in greenhouse gas credits rather than fines. Kenworth and Peterbilt are PACCAR nameplates.

### **Time horizon**

Short-term

### **Likelihood**

Unlikely

### **Magnitude of impact**

Medium

### **Potential financial impact**

168000000

### **Explanation of financial impact**

The financial impact of climate-related compliance risk is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects. For example, the potential financial implications for non-compliant vehicles and engines include loss of sales and/or fines and penalties. Recent penalties on a competitor's engines that exceeded EPA's engine emissions standards amounted to about $2,000 per engine. If the same penalty was applied to PACCAR’s 2017 vehicle sales in the US and Canada, that would be a cost of $168,000,000 due to non-compliance penalties, which is a substantive financial impact.

### **Management method**

The risk of new greenhouse gas regulation of existing products is managed through continuous improvement of fuel efficiency, alternative and low carbon fuel compatible products including hybrids. PACCAR spent $170 million on advanced vehicle technology research and development in 2017 and launched many new products that offer better fuel economy and lower greenhouse gas emissions. For example, in 2017 Peterbilt introduced enhancements to Model 579 EPIQ, which improves fuel economy by eight percent over the 2016 model. Improvements included automated transmissions, lower weight, predictive cruise control and redesigned power distribution system. PACCAR’s strategy for developing compliant vehicles resulted in lower operating cost due to fine avoidance and a credit for exceeding greenhouse gas emission standards in the U.S.

### **Cost of management**

170000000

### **Comment**

PACCAR spent $170 million on advanced vehicle technology research and development in 2017 and launched many new products that offer better fuel economy and lower greenhouse gas emissions. The cost to manage the product regulatory risk includes product research and development, policy engagement and compliance testing and is considered a standard part of research and development, capital budgeting and operating expense.

### **Identifier**

Risk 3

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

Customer

### **Risk type**

Transition risk

### **Primary climate-related risk driver**

Market: Changing customer behavior

### **Type of financial impact driver**

Market: Reduced demand for goods and/or services due to shift in consumer preferences

### **Company- specific description**

Customers may be increasingly interested in environmentally innovative vehicles and engines that can reduce their carbon footprint and reduce their operating costs by using less fuel. The risk to PACCAR is that changing customer preferences could lead to lower demand and lower sales if Kenworth, Peterbilt and DAF commercial vehicles do not meet changing customer expectations for vehicles and engines with improved fuel economy and reduced greenhouse gas emissions. For example, without the new DAF models XF and CF, which improve fuel efficiency and reduce emissions including greenhouse gas emissions by 7% over previous models, sales could have decreased in 2017. As another example, Kenworth and Peterbilt are participating in the Department of Energy’s SuperTruck II program to demonstrate 100 percent improvement in freight efficiency over 2009 equivalent product and achieve 55 percent in engine brake efficiency to improve fuel economy, and reduce costs and emissions including greenhouse gas emissions. Without such continuous innovation in PACCAR vehicles, future demand and sales could decrease substantially. DAF, Kenworth and Peterbilt are PACCAR nameplates.

### **Time horizon**

Medium-term

### **Likelihood**

Unlikely

### **Magnitude of impact**

Medium

### **Potential financial impact**

195000000

### **Explanation of financial impact**

The financial impact of climate-related transition risk such as shifting customer preferences is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects. For example, a 1% drop in sales due to customer dissatisfaction with environmental and fuel economy performance of PACCAR's vehicles would amount to $195 million decrease in revenue based on PACCAR’s 2017 earnings, which is a substantive financial impact.

### **Management method**

PACCAR manages this risk by continuing to expand advanced technology truck offerings, which exceed customer performance expectations through innovative research and development, partnerships and collaboration. PACCAR spent $170 million on advanced vehicle technology research and development in 2017 and launched many new products that offer better fuel economy and lower greenhouse gas emissions. As an example of PACCAR's strategic focus on improving fuel economy, in 2017 DAF introduced enhanced MX-11 and MX-13 engines and accompanying axles that reduce fuel consumption by 6% compared with the 2016 model. The upgraded engines and axles provide efficiencies of downshifting, reduced weight and lower engine speeds while delivery higher torque which allows for more fuel efficient operation. A new oil module also reduces oil pressure and continuously variable cooling water and steering pumps further improve fuel economy.

### **Cost of management**

170000000

### **Comment**

PACCAR spent $170 million on advanced vehicle technology research and development in 2017 and launched many new products that offer better fuel economy and lower greenhouse gas emissions. PACCAR's research and development spending decisions are strategically focused on product innovation including reducing greenhouse gas emissions and improving fuel economy.

## **C2.4**

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

Yes

## **C2.4a**

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

### **Identifier**

Opp1

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

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 driver**

Increased revenue through demand for lower emissions products and services

### **Company- specific description**

PACCAR can increase revenue by exceeding customer’s increasing demand for compliant, lower emissions trucks. Demand for lower emissions vehicles can be driven by new regulations or by shifting customer preferences. New regulations such as the U.S. EPA's Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium and Heavy Duty Engines and Vehicles as found in Federal Register Vol 78 No 116 require PACCAR to improve fuel efficiency and reduce greenhouse gas emissions from the commercial vehicles and engines sold in the US. Canada has similar regulations. Customers may also be increasingly interested in environmentally innovative vehicles and engines that can reduce their carbon footprint and their operating costs by using less fuel. The opportunity for PACCAR is to increase revenues by developing compliant advanced environmentally innovative commercial vehicles that improve fuel economy and reduce greenhouse gas emissions and customer operating costs. An example is Peterbilt’s new model 579 EPIQ that improves fuel economy by 8% over the previous model year. Peterbilt is a PACCAR nameplate.

### **Time horizon**

Short-term

### **Likelihood**

Likely

### **Magnitude of impact**

Medium

### **Potential financial impact**

195000000

### **Explanation of financial impact**

The financial impact of the climate-related opportunity to increase revenue by meeting the increasing demand for lower emissions vehicles is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects. For example, a 1% increase in sales of compliant, more fuel-efficient vehicles results in $195 million in additional revenue based on PACCAR’s 2017 earnings, which is a substantive financial impact. The financial impact of new compliant heavy-duty vehicles, such as the Peterbilt 579, which significantly reduces customer operating costs and air emissions including greenhouse gas emissions is substantive and a key part of PACCAR's business strategy to increase revenues.

### **Strategy to realize opportunity**

PACCAR’s strategy for increasing revenues by exceeding customer demand for lower emissions vehicles is based on leveraging customer partnerships and collaboration, and funding research and development focused on product innovation to improved fuel economy, and to meet or exceed global customer expectations. An example of product enhancement through research and development includes Peterbilt's new model 579 EPIQ that improves fuel economy by 8% over the previous model year. Peterbilt’s Model 579 improvements include automated transmission and fuel-efficient PACCAR MX 11 and 13 engines. Another example of research and development include the enhanced DAF CF and XF models with engine innovations, new driveline and aerodynamic optimization resulting in 7% lower fuel consumption and emissions including greenhouse gas emissions. As another example, in 2017 Kenworth collaborated with its customer, UPS, in the Department of Energy’s SuperTruck II program to demonstrate 100 percent improvement in freight efficiency over 2009 equivalent product and achieving 55 percent in engine brake efficiency to improve fuel economy and reduce costs and emissions including greenhouse gas emissions. Kenworth’s Supertruck II initiative will support UPS’s sustainability commitment to reduce its absolute greenhouse gas emissions from global ground operations 12 percent by 2025. DAF, Kenworth and Peterbilt are PACCAR nameplates.

### **Cost to realize opportunity**

170000000

### **Comment**

PACCAR spent $170 million on advanced vehicle technology research and development in 2017 and launched many new products that offer better fuel economy and lower greenhouse gas emissions. PACCAR's research and development spending decisions are strategically focused on product innovation including reducing greenhouse gas emissions and improving fuel economy.

### **Identifier**

Opp2

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

Supply Chain

### **Opportunity type**

Products and services

### **Primary climate-related opportunity driver**

Development of new products or services through R&D and innovation

### **Type of financial impact driver**

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

### **Company- specific description**

PACCAR can increase revenues by developing innovative products that anticipate shifting customer preferences through research and development, and supplier partnerships and collaborations. For example, the new DAF models XF and CF improves fuel efficiency and reduces emissions including greenhouse gas emissions by 7% over previous model years. As another example of product innovation to anticipate customer demands for fuel-efficient vehicles, Kenworth and Peterbilt are participating in the Department of Energy’s SuperTruck II program to demonstrate 100 percent improvement in freight efficiency over 2009 equivalent product and achieving 55 percent in engine brake efficiency to improve fuel economy and reduce costs and emissions including greenhouse gas emissions. DAF, Kenworth and Peterbilt are PACCAR nameplates.

### **Time horizon**

Medium-term

### **Likelihood**

Likely

### **Magnitude of impact**

Medium

### **Potential financial impact**

195000000

### **Explanation of financial impact**

The financial impact of the climate-related opportunity to increase revenues by developing new products that anticipate shifting customer preferences is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects. For example, a 1% increase in sales due to increased demand for PACCAR’s advance vehicles such as the new DAF XF and CF which offer improved fuel-efficiency and lower operating costs than previous models results in $195 million in additional revenue based on 2017 financial results, which is a substantive financial impact. DAF is a PACCAR nameplate.

### **Strategy to realize opportunity**

PACCAR focuses strategic efforts on supplier partnerships, collaboration and research and development spending focused on product innovation to increase revenues by exceeding customer expectations for improving fuel economy and lower emissions. For example, in 2017 DAF collaborated with TRL, the UK's Transport Research Laboratory, along with TNO, Ricardo, DHL to advance truck-platooning trials in the UK to lower greenhouse gas emissions by 10%. In addition, PACCAR spent $170 million on advanced vehicle technology research and development in 2017 and launched many new products that offer better fuel economy and lower greenhouse gas emissions. As an example of PACCAR's strategic focus on improving fuel economy through supplier collaboration, in 2017 Kenworth manufactured T680 on highway, as well as the T880 and T880 vocational vehicles with Cummins Westport ISL G Near Zero NOx natural gas engines which are also compatible with renewable natural gas which reduces greenhouse gas emissions even further. Another example of supplier collaboration includes Peterbilt's participation in the Department of Energy's Supertruck II program with supplier Cummins to demonstrate 100 percent improvement in freight efficiency over 2009 equivalent product and achieving 55 percent in engine brake efficiency to improve fuel economy and reduce costs and emissions including greenhouse gas emissions. DAF, Kenworth and Peterbilt are PACCAR nameplates.

### **Cost to realize opportunity**

170000000

### **Comment**

PACCAR spent $170 million on advanced vehicle technology research and development in 2017 and launched many new products that offer better fuel economy and lower greenhouse gas emissions. PACCAR's research and development spending decisions are strategically focused on product innovation including reducing greenhouse gas emissions and improving fuel economy.

### **Identifier**

Opp3

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

Direct operations

### **Opportunity type**

Products and services

### **Primary climate-related opportunity driver**

Other

### **Type of financial impact driver**

Other, please specify (Weather-related resiliency )

### **Company- specific description**

PACCAR can increase revenues with business continuity and resiliency planning to respond to climate related physical risks of extreme weather damage. Extreme weather events can cause power outages, floods, landslides, and damage facility and transportation infrastructure such as buildings, roads, bridges and rail tracks. By understanding the potential impacts to production and distribution systems, PACCAR can mitigate impacts to operations and optimize recovery, thereby increasing revenues. For example, if increased climate related weather calamities such as tornadoes were to interrupt operations of the PACCAR Parts Distribution Center in Oklahoma City, implementation of PACCAR’s Business Continuity and Disaster Recovery plans including utilizing other distribution centers while repairing PACCAR Parts Oklahoma City distribution center would insure that PACCAR Parts customers could recover quickly. As a result, PACCAR’s sales and reputation could be improved leading to higher revenues than would otherwise be possible.

### **Time horizon**

Short-term

### **Likelihood**

Unlikely

### **Magnitude of impact**

Medium

### **Potential financial impact**

184000000

### **Explanation of financial impact**

The financial impact of climate-related opportunity is based on key assessment aspects including the proportion of business units affected, the size of the impact on those business units and the potential shareholder or customer concern. A substantive financial impact could occur due to a large change in one of these key aspects or a small change in all three aspects. For example, the potential financial implication of weather related resiliency depends upon the duration of the interruption of operations at the Parts Distribution Center in Oklahoma City due to tornado damage. The ability to shift capacity to nearby PACCAR Parts Distribution centers for a year-long shutdown of PACCAR Parts Distribution Center in Oklahoma City while repairing the tornado damage could improve revenue by 1/18th of the PACCAR Parts revenue in 2017 or $184 million, which is a substantive financial impact. This is because there were 18 global PACCAR Parts facilities globally generating $3,327 million in 2017.

### **Strategy to realize opportunity**

Strategic management of the opportunity to increase revenue by adopting plans for business continuity and resiliency to respond to weather related damage is part of PACCAR's standard business planning which is performed every 6 months, annually, every two years and every 5 years with a different focus during each round of review. External auditors also evaluate business continuity annually at each of our locations. PACCAR facility level strategic focus is to maintain operational flexibility. The ability to shift production and parts operations to other geographic areas that are not impacted by regional disasters is key to PACCAR's weather-related resiliency. As an example, increasing extreme weather events such as tornadoes in Oklahoma could interrupt business operations in and around the PACCAR Parts Distribution Center in Oklahoma City. PACCAR Parts business continuity planning includes evaluation of regional alternatives for both supplier logistics, and customer deliveries in the event of business interruptions at any one of their facilities including weather related damage such as from tornadoes.

### **Cost to realize opportunity**

10800000

### **Comment**

Costs for management of weather related risks is part of PACCAR's standard operating costs. For comparison with risks, PACCAR Parts Selling, General and Administrative (SGandA) costs in 2017 were $195 million, a small part of which was related to managing operational risks of weather related losses. Costs applicable to one of the Oklahoma City distribution center are calculated by dividing the annual SGandA costs for PACCAR Parts by 18, the number of PACCAR Parts facilities worldwide or $10,800,000.

## **C2.5**

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

|  |  |  |
| --- | --- | --- |
|  | **Impact** | **Description** |
| Products and services | Impacted | Because of product related risks and opportunities of regulation of greenhouse gas emissions and customer shifting preferences for compliant, low emission products, the focus of PACCAR’s product innovation has been greatly impacted. As a result, PACCAR’s research and development into fuel efficient and advanced low carbon vehicles amounted to $170 million in 2017 which is 64% of all research and development spending in 2017. |
| Supply chain and/or value chain | Impacted | Both weather related risks and opportunities and product related risks and opportunities have significantly impacted the supply chain. Both the risk of weather related damage and the opportunities for business resiliency resulted in PACCAR's ability to shift operations geographically, such as from one PACCAR Parts Distribution center to another to increase revenues. Supplier and customer contacts and logistics are managed to successfully shift operations. Also, the risk and opportunities for regulation of product greenhouse gas emissions and shifting customer preferences for lower emissions vehicles have catalyzed PACCAR to develop partnerships and collaborations with suppliers and customers for product innovation to exceed our customer expectations of compliant, low emission and low carbon vehicles. |
| Adaptation and mitigation activities | Impacted | Both the risk of weather related damage and the opportunities for business resiliency have significantly impacted operational adaptation and mitigation. Both the risk of weather related damage and the opportunities for business resiliency require the ability to shift operations geographically, such as from one PACCAR Parts Distribution center to another to increase revenues. Business continuity planning is undertaken and capital invested where needed to support timely disaster recovery. For example, adaptation and mitigation are required to manage operational flexibility in the event of tornado damage at one of our PACCAR parts distribution centers. Such an event would require the ability to shift operations from one PACCAR Parts Distribution center to another to increase revenues. Options for supplier and customer contacts and logistics adaptation and mitigation are established before operational disruption to successfully respond during disasters to maximize revenues. |
| Investment in R&D | Impacted | Because of product related risks and opportunities of regulation of greenhouse gas emissions and customer shifting preferences for compliant, low emission products, the focus of PACCAR’s product innovation has been greatly impacted. As a result, investment in research and development of fuel efficient and advanced low carbon vehicles amounted to $170 million in 2017, which is 64% of all research and development spending in 2017. |
| Operations | Impacted | Both weather related risks and opportunities and product related risks and opportunities have significantly impacted PACCAR operations. Both the risk of weather related damage and the opportunities for business resiliency require the ability to shift operations geographically, such as from one PACCAR Parts Distribution center to another to increase revenues. Business continuity planning is undertaken and capital invested where needed to support timely disaster recovery. In addition, the risk and opportunities for regulation of product greenhouse gas emissions and shifting customer preferences for lower emissions vehicles require facility upgrades to produce new compliant and lower emission trucks. As a result, PACCAR invested $433.1 million in capital in 2017 and $6.1 billion over the last 10 years in world-class facilities, innovative products and new technologies. |
| Other, please specify | Please select |  |

## **C2.6**

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

|  |  |  |
| --- | --- | --- |
|  | **Relevance** | **Description** |
| Revenues | Impacted | Because of product related risks and opportunities of regulation of greenhouse gas emissions and customer shifting preferences for compliant, low emission products, revenue planning takes into account the development of innovative products that meet or exceed our customer's shifting expectations for advanced technology vehicles that are both compliant and lower in operating costs. Improving fuel economy, which also reduces fuel related emissions, improves our customer's bottom lines. As an example, 2017 revenue planning took into account the customer preferences and regulatory compliance of Kenworth’s T680 on highway, as well as the T880 and T880 vocational vehicles with Cummins Westport ISL G Near Zero NOx natural gas engines, which are also compatible with renewable natural gas which reduces greenhouse gas emissions even further. Kenworth is a PACCAR nameplate. |
| Operating costs | Impacted | The risks and opportunities from weather related damage and business resiliency, and shifting customer preferences for compliant, fuel-efficient vehicles was a significant factor in planning for 2017 operating expenditures. Sufficient funding of operations was needed to address business continuity planning and to invest in product research and development of compliant and fuel efficient vehicles. PACCAR’s research and development into fuel efficient and advanced low carbon vehicles amounted to $170 million in 2017 which is 64% of all research and development spending in 2017. In this way, PACCAR expanded its vehicle product range, invested in truck and powertrain technologies that increase vehicle fuel efficiency and reliability, and enhanced its manufacturing and parts distribution centers. |
| Capital expenditures / capital allocation | Impacted | In 2017, capital investment planning was significantly impacted by both the risks and opportunities for shifting customer preferences for compliant and fuel-efficient vehicles. For example, in 2017 PACCAR spent $433.1 million on facility improvements to manufacture advanced vehicles such as the Kenworth T680 on highway, as well as the T880 and T880 vocational vehicles with Cummins Westport ISL G Near Zero NOx natural gas engines, which are also compatible with renewable natural gas which reduces greenhouse gas emissions even further. |
| Acquisitions and divestments | Not impacted | In 2017, PACCAR’s planning for acquisitions and divestments was not impacted by risks and opportunities for weather related damage, business continuity or shifting customer preferences for compliant, fuel-efficient vehicles. Both risks and opportunities were managed through investment in existing operations and facilities. |
| Access to capital | Not impacted | In 2017, PACCAR’s planning related to access to capital was not impacted by risks and opportunities for weather related damage, business continuity or shifting customer preferences for compliant, fuel-efficient vehicles. Both risks and opportunities were successfully managed through continued focus on advanced vehicle technology, product innovation and low operating costs. As a result, PACCAR's continued outstanding credit rating and financial strength insures access to capital. |
| Assets | Impacted | In 2017, PACCAR’s asset planning for was significantly impacted by both the risks and opportunities for shifting customer preferences for compliant and fuel-efficient vehicles. For example, in 2017 PACCAR spent $433.1 million on facility improvements to manufacture advanced vehicles such as Kenworth manufactured T680 on highway, as well as the T880 and T880 vocational vehicles with Cummins Westport ISL G Near Zero NOx natural gas engines, which are also compatible with renewable natural gas, which reduces greenhouse gas emissions even further. |
| Liabilities | Not impacted | Both the risks and opportunities of weather related damage and business continuity, as well as product compliance including greenhouse gas emissions regulations and shifting customer preferences for low emissions products have not impacted PACCAR’s planning related to liabilities because PACCAR addresses risks and opportunities proactively through product research and development, and continuous product innovations, and business continuity planning. For example, PACCAR’s research and development into fuel efficient and advanced low carbon vehicles amounted to $170 million in 2017 which is 64% of all research and development spending in 2017. In this way, PACCAR expanded its vehicle product range, invested in truck and powertrain technologies that increase vehicle fuel efficiency and reliability, and enhanced its manufacturing and parts distribution centers. |
| 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?**

No, but we anticipate doing so in the next two years

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

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

In development, we plan to complete it within the next 2 years

## **C3.1c**

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

Setting emissions intensity reduction targets of 15% by 2020 for facilities, 6% by 2018 for product emissions intensity in North America and 20% by 2020 for product emissions in Europe and collecting and disclosing CO2 emissions from all facilities and products provides the quantitative context to reduce emissions and costs internally and for PACCAR’s customers. For example, PACCAR spent $170 million in 2017 for research and development focused on reducing greenhouse gas emissions in commercial vehicles. Both regulatory changes, such as greenhouse gas emissions standards for commercial vehicles in the U.S. and E.U., and customer expectations for improved fuel efficiency and alternative fuel flexibility are driving internal innovation in environmentally advanced commercial transport. Focusing on reducing customer operating costs and reducing emissions offers competitive opportunity globally. PACCAR's short-term strategy includes greater transparency and disclosure of climate change related data and activities, as well as continued improvement in the internal integration of climate change opportunities and risks into PACCAR's existing business processes such as new product development, Six Sigma, ISO14001, and capital project approvals and administration. PACCAR's long term business strategy includes continued product development to meet greenhouse gas and other emissions reduction targets, improve fuel economy and provide options for alternative and low carbon fuels transport, engagement with policy makers to optimize regulatory approaches (i.e, global standardization of fuel and emissions standards), reduce facility related costs and impacts by reducing energy use and attaining greenhouse gas emission reduction targets. Development of more fuel-efficient products may increase market share by reducing customer’s costs and enhancing their environmental performance. PACCAR's most substantial climate change related business decision in 2017 was to spend $170 million on research and development in 2017 to reduce greenhouse gas emissions and improve the fuel economy of our vehicles and engines. PACCAR’s climate change strategy is to produce the most fuel-efficient trucks in the industry. For example in 2017, PACCAR introduced new DAF CF and XF models with highly efficient transmissions and rear axles. Along with a new compact after-treatment system, sophisticated software and aerodynamic optimization, the new DAF CF and XF reduce CO2 emissions by 7% compared with previous year models.

## **C3.1g**

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

PACCAR does not currently use climate-related scenario analysis because the TCSD framework is new and the transport specific transition scenarios were only recently made available. The new TCSD framework and transition scenarios have not yet been incorporated into PACCAR’s integrated business planning processes nor PACCAR’s current use of third party evaluation of facility and operational risks including physical risks from climate change extreme events. PACCAR is evaluating climate-related scenario analysis within business planning and strategy development, and plans to implement within the next two years. The process will be stepwise starting with a qualitative assessment of one transition risk and one physical risk over short, medium and long-term timelines. Resources will include selection of a publicly available scenario for both transition and physical risks and further engagement and research with experts and stakeholders.

## **C4. Targets and performance**

## **C4.1**

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

Intensity target

## **C4.1b**

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

### **Target reference number**

Int 1

### **Scope**

Scope 1+2 (location-based)

### **% emissions in Scope**

100

### **% reduction from baseline year**

15

### **Metric**

Metric tons CO2e per unit revenue

### **Base year**

2013

### **Start year**

2014

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

281378

### **Target year**

2020

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

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

### **% achieved (emissions)**

100

### **Target status**

Underway

### **Please explain**

In 2017, PACCAR achieved a 21% reduction in global scope 1 and 2 greenhouse gas intensity, which exceeds our 2020 target of 15%. Absolute Scope 1 and 2 greenhouse gas emissions decreased 2% between 2017 and the baseline year of 2013. Absolute Scope 1 and 2 greenhouse gas emissions also decreased 1.5 % between 2016 and 2017 despite higher build rates, increases in facility square footage and in the number of employees due to energy efficiency projects.

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

-2

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

0

### **Target reference number**

Int 2

### **Scope**

Scope 3: Use of sold products

### **% emissions in Scope**

42

### **% reduction from baseline year**

6

### **Metric**

Other, please specify (kg CO2 per ton-mile)

### **Base year**

2010

### **Start year**

2011

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

0.06

### **Target year**

2018

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

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

### **% achieved (emissions)**

100

### **Target status**

Underway

### **Please explain**

In 2017, PACCAR achieved a 21.93% reduction in vehicle CO2 emissions in the US and Canada, exceeding our reduction target. CO2 emissions reductions continue each year due to product innovation in improving fuel economy and our customer's purchases of those innovative models. Absolute vehicle CO2 emissions increased by 11% between 2017 and 2016 due to a 13% increase in unit sales.

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

0

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

11

## **C4.2**

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

## **C4.3**

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

Yes

## **C4.3a**

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

|  |  |  |
| --- | --- | --- |
|  | **Number of projects** | **Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked \*)** |
| Under investigation | 16 |  |
| To be implemented\* | 7 | 1471 |
| Implementation commenced\* | 2 | 993 |
| Implemented\* | 42 | 17153629 |
| Not to be implemented | 3 |  |

## **C4.3b**

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

### **Activity type**

Energy efficiency: Processes

### **Description of activity**

Other, please specify (Compressors, material handling)

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

1235

### **Scope**

Scope 1

Scope 2 (location-based)

### **Voluntary/Mandatory**

Voluntary

### **Annual monetary savings (unit currency – as specified in CC0.4)**

921797

### **Investment required (unit currency – as specified in CC0.4)**

1878670

### **Payback period**

1-3 years

### **Estimated lifetime of the initiative**

6-10 years

### **Comment**

### **Activity type**

Energy efficiency: Building services

### **Description of activity**

Other, please specify (lighting, HVAC, controls)

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

6981

### **Scope**

Scope 1

Scope 2 (location-based)

### **Voluntary/Mandatory**

Voluntary

### **Annual monetary savings (unit currency – as specified in CC0.4)**

1075266

### **Investment required (unit currency – as specified in CC0.4)**

12262732

### **Payback period**

11-15 years

### **Estimated lifetime of the initiative**

16-20 years

### **Comment**

### **Activity type**

Energy efficiency: Building fabric

### **Description of activity**

Maintenance program

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

107

### **Scope**

Scope 1

Scope 2 (location-based)

### **Voluntary/Mandatory**

Voluntary

### **Annual monetary savings (unit currency – as specified in CC0.4)**

10000

### **Investment required (unit currency – as specified in CC0.4)**

20000

### **Payback period**

1-3 years

### **Estimated lifetime of the initiative**

3-5 years

### **Comment**

### **Activity type**

Low-carbon energy installation

### **Description of activity**

Solar PV

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

145

### **Scope**

Scope 2 (location-based)

### **Voluntary/Mandatory**

Voluntary

### **Annual monetary savings (unit currency – as specified in CC0.4)**

26390

### **Investment required (unit currency – as specified in CC0.4)**

118966

### **Payback period**

4 - 10 years

### **Estimated lifetime of the initiative**

16-20 years

### **Comment**

### **Activity type**

Other, please specify (Supply Chain logistics improvements)

### **Description of activity**

<Not Applicable>

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

84

### **Scope**

Scope 3

### **Voluntary/Mandatory**

Voluntary

### **Annual monetary savings (unit currency – as specified in CC0.4)**

191645

### **Investment required (unit currency – as specified in CC0.4)**

512157

### **Payback period**

1-3 years

### **Estimated lifetime of the initiative**

6-10 years

### **Comment**

### **Activity type**

Other, please specify (Product Use Emissions)

### **Description of activity**

<Not Applicable>

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

17145076

### **Scope**

Scope 3

### **Voluntary/Mandatory**

Voluntary

### **Annual monetary savings (unit currency – as specified in CC0.4)**

4484433286

### **Investment required (unit currency – as specified in CC0.4)**

170226000

### **Payback period**

<1 year

### **Estimated lifetime of the initiative**

6-10 years

### **Comment**

Product Use Emissions in the US and Canada decreased by 21.93% from the 2010 base year. The decrease in emissions exceeded the regulatory requirements and are identified as voluntary. Savings were calculated based on fuel savings for our customers. Investment required based on 2017 Research and Development spend to improve truck and engine fuel economy.

## **C4.3c**

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

|  |  |
| --- | --- |
| **Method** | **Comment** |
| Internal incentives/recognition programs | PACCAR’s six sigma and EcoDesign programs include annual monetary awards and recognition for best environmental projects including energy and emissions reduction projects. |
| Employee engagement | PACCAR’s manufacturing locations are ISO14001 certified and include continuous environmental improvement including reducing energy use and emissions. |
| Financial optimization calculations | Energy and greenhouse gas reduction projects are included in PACCAR’s global capital budget review process. |
| Compliance with regulatory requirements/standards | PACCAR’s global capital budget process fast tracks regulatory compliance projects including emissions reductions and energy efficiency requirements. |

## **C4.5**

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

Yes

## **C4.5a**

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

### **Level of aggregation**

Company-wide

### **Description of product/Group of products**

Use of PACCAR's fuel efficient engines and vehicles, electric and hybrid vehicles and low carbon fuel vehicles reduces customer Scope 1 greenhouse gas emissions by replacing less fuel efficient older models in the US, Canada and Europe.

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

Avoided emissions

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

Other, please specify (Fuel efficiency, low carbon and other)

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

67

### **Comment**

For example, customers in the US and Canada that replaced older vehicles with a 2017 PACCAR model reduced fleet emission by 93 tonnes per unit per year. Emissions reduction calculations are based on a 21.9 % reduction in 2017 from the 2010 base year, EPA's emission factor of 10.18 kg CO2 emissions per gallon of diesel and fuel efficiency of 155 ton-mpg in 2010, and an assumed 200,000 miles travelled per year and gross combined vehicle weight of 65,000 pounds.

## **C5. Emissions methodology**

## **C5.1**

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

### **Scope 1**

### **Base year start**

January 1 2013

### **Base year end**

December 31 2013

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

107754

### **Comment**

### **Scope 2 (location-based)**

### **Base year start**

January 1 2013

### **Base year end**

December 31 2013

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

173623

### **Comment**

### **Scope 2 (market-based)**

### **Base year start**

### **Base year end**

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

### **Comment**

## **C5.2**

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

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

## **C6. Emissions data**

## **C6.1**

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

### **Row 1**

### **Gross global Scope 1 emissions (metric tons CO2e)**

109976

### **End-year of reporting period**

<Not Applicable>

### **Comment**

## **C6.2**

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

### **Row 1**

### **​Scope 2, location-based​**

We are reporting a Scope 2, location-based figure

### **Scope 2, market-based**

We are reporting a Scope 2, market-based figure

### **Comment**

## **C6.3**

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

### **Row 1**

### **Scope 2, location-based**

165487

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

171728

### **End-year of reporting period**

<Not Applicable>

### **Comment**

## **C6.4**

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

Yes

## **C6.4a**

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

### **Source**

CO2e emissions related to CH4 and N2O from some fuel combustion and electricity purchased.

### **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 the source is excluded**

N20 and CH4 emissions amount to less than a 1% change in PACCAR's overall emissions.

### **Source**

CO2 emissions from various small offices or leased facilities where energy usage data is not readily available.

### **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 the source is excluded**

Based on the square footage of these small offices and leased facilities and the average energy intensity of similar facilities operated by PACCAR, the consolidated CO2 emissions are less than 1% of PACCAR's overall CO2 emissions.

## **C6.5**

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

### **Purchased goods and services**

### **Evaluation status**

Not relevant, calculated

### **Metric tonnes CO2e**

3176610

### **Emissions calculation methodology**

Calculations are based on the number of new truck deliveries in 2017 and internal life cycle assessment of material components of heavy duty trucks less the amount of emissions associated with in-sourcing of components such as engines. The internal LCA was compared with industry-wide analysis by the Argonne National Laboratory to verify data quality. Component emission factors are based on published values including those from the IPCC, UNFCCC and ICLEI.

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

0

### **Explanation**

The calculated CO2e emissions from purchased goods and services are much less than 5% of overall Scope 3 emissions.

### **Capital goods**

### **Evaluation status**

Not relevant, calculated

### **Metric tonnes CO2e**

1143950

### **Emissions calculation methodology**

2017 payments for property plant and equipment including equipment acquired for operating leases less asset disposal proceeds was multiplied by the appropriate emission factor for supply chain emissions from DEFRA 2013 Environmental Reporting Guidelines.

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

0

### **Explanation**

The calculated capital goods related CO2e emissions are much less than 5% of overall Scope 3 emissions.

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

### **Evaluation status**

Not relevant, calculated

### **Metric tonnes CO2e**

24528

### **Emissions calculation methodology**

The UNFCCC/CCNUCC default emissions factors for upstream emissions from natural gas, diesel, propane, butane, gasoline and jet fuel were applied to 2017 usage. Country specific emission factors for electricity transmission and distribution losses were obtained from the World Bank online data tables and multiplied by PACCAR's electricity usage for each country.

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

0

### **Explanation**

The calculated upstream fuel and energy CO2e emissions are much less than 5% of overall Scope 3 emissions.

### **Upstream transportation and distribution**

### **Evaluation status**

Not relevant, calculated

### **Metric tonnes CO2e**

1166395

### **Emissions calculation methodology**

Calculation based on PACCAR's global new truck deliveries in 2017, actual logistics miles travelled in the North America, PACCAR's 2016 EPA SmartWay composite freight emission factor, North American spend for ocean and Air Freight and DEFRA's June 2013 Environmental Reporting Guidelines emission factors for ocean and air freight. Global emissions are extrapolated based on proportional new truck deliveries.

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

60

### **Explanation**

The calculated upstream transportation and distribution CO2 emissions are much less than 5% of overall Scope 3 emissions which is the threshold considered to be relevant.

### **Waste generated in operations**

### **Evaluation status**

Not relevant, calculated

### **Metric tonnes CO2e**

253

### **Emissions calculation methodology**

PACCAR recycles or recovers energy from most (99.4%) of its waste with most manufacturing facilities achieving Zero Waste to Landfill status. CO2 emissions from waste are calculated based on internal tracking of manufacturing waste and EPA's warm model for emissions for each waste stream based on how it is recycled, combusted for energy recovery or disposed in a landfill. Emissions credits due to recycling and energy recovery are not reported.

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

100

### **Explanation**

The calculated CO2 emissions from waste generated from operations are much less than 5% of overall Scope 3 emissions which is the threshold considered to be relevant.

### **Business travel**

### **Evaluation status**

Not relevant, calculated

### **Metric tonnes CO2e**

9747

### **Emissions calculation methodology**

Air travel CO2 emissions are provided by PACCAR's global travel agent and do not yet include data for travel originating from the U.K. and Australia. Business travel in company owned and leased vehicles is included in Scope 1 emissions.

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

80

### **Explanation**

The calculated CO2 emissions from business air travel are provided by our travel supplier and are much less than 5% of overall Scope 3 emissions which is the threshold considered to be relevant.

### **Employee commuting**

### **Evaluation status**

Not relevant, calculated

### **Metric tonnes CO2e**

40425

### **Emissions calculation methodology**

Calculated based on CDP data for industrial and auto manufacturers multiplied by the current number of PACCAR's worldwide full time employees.

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

0

### **Explanation**

Sensitivity analysis of industry specific emission factors using high, low and average values does not change the finding that CO2e emissions from employee commuting does not exceed the 5% relevancy threshold.

### **Upstream leased assets**

### **Evaluation status**

Not relevant, explanation provided

### **Metric tonnes CO2e**

### **Emissions calculation methodology**

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

### **Explanation**

CO2e emissions from leased assets that are operated by PACCAR are included in Scope 1 and 2 emissions reported.

### **Downstream transportation and distribution**

### **Evaluation status**

Not relevant, calculated

### **Metric tonnes CO2e**

238339

### **Emissions calculation methodology**

Calculation is based on PACCAR's global new truck deliveries in 2017, outbound finished truck delivery miles in North America, and PACCAR's 2016 EPA SmartWay composite freight emission factor. Global emissions are extrapolated based on proportional new truck deliveries.

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

60

### **Explanation**

The calculated CO2 emissions for downstream transportation and distribution are less than 5% of overall Scope 3 emissions which is the threshold considered relevant.

### **Processing of sold products**

### **Evaluation status**

Not relevant, calculated

### **Metric tonnes CO2e**

94935

### **Emissions calculation methodology**

PACCAR's products are processed further by adding trailers and equipment, or mounting winches. Estimating downstream emissions related to processing of sold products is based on the new truck deliveries multiplied by an emission factor using internal emissions intensity for similar processes.

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

0

### **Explanation**

The calculated CO2 emissions downstream processing of sold products are much less than 5% of overall Scope 3 emissions.

### **Use of sold products**

### **Evaluation status**

Relevant, calculated

### **Metric tonnes CO2e**

130395880

### **Emissions calculation methodology**

Calculations based on global new truck deliveries in 2017 of 158,900 vehicles with an estimated average freight efficiency of 155 ton-mpg, 65,000 pound vehicle weight, and 435,000 miles useful life less 21.93% emissions reductions for vehicles sold in the US and Canada.

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

0

### **Explanation**

Product use emissions are based on EPA assumptions for useful miles, gross vehicle weight and ton mile per gallon baseline year of 2010 with adjustments for emissions reductions in the current year.

### **End of life treatment of sold products**

### **Evaluation status**

Not relevant, calculated

### **Metric tonnes CO2e**

11772

### **Emissions calculation methodology**

Calculations are based on the 2017 new truck deliveries and life cycle assessment modeling of recyclable content. Emission factors for non-recyclable plastics, rubber and miscellaneous materials such as textiles are based on EPA's WARM waste GHHG emissions model.

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

0

### **Explanation**

The calculated CO2e emissions for the end of life treatment of product sold are much less than 5% of Scope 3 emissions and are considered not relevant.

### **Downstream leased assets**

### **Evaluation status**

Relevant, calculated

### **Metric tonnes CO2e**

15775213

### **Emissions calculation methodology**

CO2 emissions for downstream leased assets is predominately related to truck leasing which is calculated by multiplying the fleet of leased vehicles by the EPA standard use factors and emissions per truck. We have also included the estimated emissions of downstream leased buildings which we own but do not operate based on the emissions intensity factor for the type of building.

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

0

### **Explanation**

Downstream leased assets include leased trucks and owned property that is leased to others.

### **Franchises**

### **Evaluation status**

Not relevant, explanation provided

### **Metric tonnes CO2e**

### **Emissions calculation methodology**

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

### **Explanation**

Company owned dealerships are included in Scope 1 and 2 emissions. All other dealerships are independently owned and operated.

### **Investments**

### **Evaluation status**

Not relevant, explanation provided

### **Metric tonnes CO2e**

### **Emissions calculation methodology**

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

### **Explanation**

Investments are related to financing of truck purchase and are included in the new truck delivery estimates of "Use of Sold Product" category.

### **Other (upstream)**

### **Evaluation status**

### **Metric tonnes CO2e**

### **Emissions calculation methodology**

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

### **Explanation**

### **Other (downstream)**

### **Evaluation status**

### **Metric tonnes CO2e**

### **Emissions calculation methodology**

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

### **Explanation**

## **C6.7**

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

No

## **C6.10**

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

### **Intensity figure**

0.000013

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

275463

### **Metric denominator**

unit total revenue

### **Metric denominator: Unit total**

21145700000

### **Scope 2 figure used**

Location-based

### **% change from previous year**

14

### **Direction of change**

Decreased

### **Reason for change**

Revenue increased and absolute greenhouse gas emissions decreased in 2017 from 2016 such that revenue intensity decreased by 14% year over year. In addition, revenue intensity is 21% lower in 2017 compared with base year 2013. PACCAR has surpassed our target of 15% reduction in revenue intensity by 2020. Energy efficiency projects, a shift to cleaner fuels such as natural gas, reduced electricity efficiency factors and a revenue increase of 14% contributed to the reduction in revenue intensity between 2016 and 2017. An example of energy efficiency projects implemented in 2017 includes replacement of lighting with LEDs at many of our facilities. Revenue is adjusted for currency exchange changes relative to baseline year 2013.

### **Intensity figure**

1.7

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

275463

### **Metric denominator**

unit of production

### **Metric denominator: Unit total**

158900

### **Scope 2 figure used**

Location-based

### **% change from previous year**

13

### **Direction of change**

Decreased

### **Reason for change**

New truck deliveries increased and absolute greenhouse gas emissions decreased in 2017 compared with 2016 such that emissions intensity for new truck deliveries decreased by 13%. In addition, emissions intensity based of new truck deliveries is 16% lower in 2017 compared with base year 2013. Energy efficiency projects, a shift to cleaner fuels such as natural gas, reduced electricity efficiency factors and an increase in truck deliveries contributed to the reduction in revenue intensity between 2016 and 2017. An example of energy efficiency projects implemented in 2017 includes replacement of lighting with LEDs at many of our facilities.

## **C7. Emissions breakdowns**

## **C7.1**

### **(C7.1) Does your organization have greenhouse gas emissions other than carbon dioxide?**

Yes

## **C7.1a**

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

|  |  |  |
| --- | --- | --- |
| **Greenhouse gas** | **Scope 1 emissions (metric tons of CO2e)** | **GWP Reference** |
| CO2 | 108220 | IPCC Fourth Assessment Report (AR4 - 100 year) |
| HFCs | 1756 | IPCC Fourth Assessment Report (AR4 - 100 year) |

## **C7.2**

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

|  |  |
| --- | --- |
| **Country/Region** | **Scope 1 emissions (metric tons CO2e)** |
| Australia | 2452 |
| Belgium | 14503 |
| Canada | 6706 |
| Mexico | 4070 |
| Netherlands | 32309 |
| United States of America | 45780 |
| United Kingdom of Great Britain and Northern Ireland | 2264 |
| Other, please specify (Rest of the World) | 1892 |

## **C7.3**

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

By activity

## **C7.3c**

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

|  |  |
| --- | --- |
| **Activity** | **Scope 1 emissions (metric tons CO2e)** |
| Manufacturing | 90355 |
| Test Facilities | 9489 |
| Warehouses | 1698 |
| Other facilities including office buildings, used truck lots and PacLease facilities. | 8434 |

## **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 | 90355 | <Not Applicable> | Includes manufacturing only. Test facilities, office buildings, warehouses and other facilities are excluded. |
| 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)** |
| Australia | 6651 |  | 6158 | 0 |
| Belgium | 11976 |  | 50530 | 0 |
| Canada | 97 |  | 17021 | 0 |
| Mexico | 20553 |  | 41113 | 0 |
| Netherlands | 40520 |  | 77625 | 77625 |
| United States of America | 80247 |  | 180618 | 0 |
| United Kingdom of Great Britain and Northern Ireland | 3741 |  | 10641 | 0 |
| Other, please specify (Rest of World) | 1703 |  | 6745 | 181 |

## **C7.6**

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

By activity

## **C7.6c**

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

|  |  |  |
| --- | --- | --- |
| **Activity** | **Scope 2, location-based emissions (metric tons CO2e)** | **Scope 2, market-based emissions (metric tons CO2e)** |
| Manufacturing | 153594 |  |
| Test Facilities | 2538 |  |
| Warehouses | 3569 |  |
| Other facilities including office buildings and used truck lots and PacLease facilities. | 5786 |  |

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

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

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Scope 2, location-based, metric tons CO2e** | **Scope 2, market-based (if applicable), metric tons CO2e** | **Comment** |
| Cement production activities | <Not Applicable> | <Not Applicable> | <Not Applicable> |
| Chemicals production activities | <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 | 153594 |  | Includes manufacturing only. Test facilities, office buildings, warehouses and other facilities are excluded. |
| 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**

Heavy Duty Vehicles (HDV)

### **Emissions intensity figure**

0.000064

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

130395880

### **Metric denominator**

t.mile

### **Metric denominator: Unit total**

203794644882

### **% change from previous year**

-1

### **Vehicle unit sales in reporting year**

158900

### **Vehicle lifetime in years**

5

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

87000

### **Load factor**

65000 pounds or 29.484 tonnes

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

Increase in total vehicle emissions from previous year due to 13% more vehicle deliveries even though we decreased per unit emissions of CO2 by 1% in the US and Canada from last year, and 21.93% from the 2010 baseline. The base case load and useful life vehicle miles are based on EPA 2010 baseline models. Please note that the metric denominator number above was shortened by one digit to conform to the online response system data entry criteria. The actual Metric Denominator: Unit Total should be 2,037,946,448,821.

## **C7.9**

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

Decreased

## **C7.9a**

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Change in emissions (metric tons CO2e)** | **Direction of change** | **Emissions value (percentage)** | **Please explain calculation** |
| Change in renewable energy consumption |  | <Not Applicable> |  |  |
| Other emissions reduction activities | 8469 | Decreased | 3 | PACCAR achieved an 8,469 tonne reduction in CO2 emissions in 2017 due to energy efficiency projects implemented in 2017. Total Scope 1 and 2 emissions were 279,717 tonnes of CO2 in 2016. This results in a 3% reduction from the previous year ((8,469/279,717)x100=3%). PACCAR achieved a reduction of absolute total Scope 1 and 2 CO2 emissions in 2017 from the previous year even with increased production volume of 13%, 9% increase in employees, and 1% increase in building square footage due to increased vigilance with overall energy efficiency behaviors. In addition, PACCAR purchased green electricity in Europe, which is not counted in our 2% absolute reduction in CO2 emissions. Including green energy purchases would reduce emissions by 15% in 2017. |
| Divestment |  | <Not Applicable> |  |  |
| Acquisitions |  | <Not Applicable> |  |  |
| Mergers |  | <Not Applicable> |  |  |
| Change in output | 39998 | Decreased | 14 | PACCAR's global production increased by 13% between 2016 and 2017 to 158,900 new truck deliveries. However, PACCAR's global greenhouse gas emissions decreased 2% on an absolute basis in 2017. This represents a 14% decrease in CO2 emissions in 2017 from business as usual projections of emissions due to energy efficiency measures and behavior modification. The 14% decrease in 2017 greenhouse gas emissions is calculated by first calculating the business as usual emissions for 2017 from the 2016 emissions intensity of 2 tonnes CO2 per unit delivered in 2017 (2 x 158,900 units = 317, 800 tonnes CO2) or 317,800 tonnes CO2 emitted in 2017 for the business as usual scenario. Actual 2017 emissions were much lower at 275,463 tonnes CO2. The reduction in CO2 emissions from business as usual is calculated by subtracting the actual emissions from the business as usual emissions (317,800 - 275,463 = 39,988 tonnes CO2 reduction). The 14% percentage reduction in 2017 CO2 emissions is then calculated by dividing the reduction in 2017 CO2 emissions by 2016 overall CO2 emissions (39,988/279,717=14.3%). |
| Change in methodology |  | <Not Applicable> |  |  |
| Change in boundary |  | <Not Applicable> |  |  |
| Change in physical operating conditions |  | <Not Applicable> |  |  |
| Unidentified |  | <Not Applicable> |  |  |
| Other |  | <Not Applicable> |  |  |

## **C7.9b**

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

Location-based

## **C8. Energy**

## **C8.1**

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

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

## **C8.2**

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

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

## **C8.2a**

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Heating value** | **MWh from renewable sources** | **MWh from non-renewable sources** | **Total MWh** |
| Consumption of fuel (excluding feedstock) | LHV (lower heating value) | 0 | 496249 | 496249 |
| Consumption of purchased or acquired electricity | <Not Applicable> | 77806 | 312646 | 390452 |
| Consumption of purchased or acquired heat | <Not Applicable> | <Not Applicable> | <Not Applicable> | <Not Applicable> |
| Consumption of purchased or acquired steam | <Not Applicable> | <Not Applicable> | <Not Applicable> | <Not Applicable> |
| Consumption of purchased or acquired cooling | <Not Applicable> | <Not Applicable> | <Not Applicable> | <Not Applicable> |
| Consumption of self-generated non-fuel renewable energy | <Not Applicable> | <Not Applicable> | <Not Applicable> | <Not Applicable> |
| Total energy consumption | <Not Applicable> | 77806 | 808895 | 886701 |

## **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 | No |
| Consumption of fuel for the generation of steam | No |
| Consumption of fuel for the generation of cooling | No |
| Consumption of fuel for co-generation or tri-generation | No |

## **C8.2c**

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

### **Fuels (excluding feedstocks)**

Acetylene

### **Heating value**

LHV (lower heating value)

### **Total fuel MWh consumed by the organization**

222

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

### **Fuels (excluding feedstocks)**

Butane

### **Heating value**

LHV (lower heating value)

### **Total fuel MWh consumed by the organization**

4

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

### **Fuels (excluding feedstocks)**

Diesel

### **Heating value**

LHV (lower heating value)

### **Total fuel MWh consumed by the organization**

100292

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

### **Fuels (excluding feedstocks)**

Petrol

### **Heating value**

LHV (lower heating value)

### **Total fuel MWh consumed by the organization**

830

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

### **Fuels (excluding feedstocks)**

Methane

### **Heating value**

LHV (lower heating value)

### **Total fuel MWh consumed by the organization**

16

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

### **Fuels (excluding feedstocks)**

Natural Gas

### **Heating value**

LHV (lower heating value)

### **Total fuel MWh consumed by the organization**

362242

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

### **Fuels (excluding feedstocks)**

Propane Gas

### **Heating value**

LHV (lower heating value)

### **Total fuel MWh consumed by the organization**

13422

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

### **Fuels (excluding feedstocks)**

Jet Kerosene

### **Heating value**

LHV (lower heating value)

### **Total fuel MWh consumed by the organization**

19220

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

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

<Not Applicable>

## **C8.2d**

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

### **Acetylene**

### **Emission factor**

244

### **Unit**

kg CO2 per MWh

### **Emission factor source**

2016 Climate Registry Table 12.1

### **Comment**

### **Butane**

### **Emission factor**

221

### **Unit**

kg CO2 per MWh

### **Emission factor source**

2016 Climate Registry Table 12.1

### **Comment**

### **Diesel**

### **Emission factor**

267

### **Unit**

kg CO2 per MWh

### **Emission factor source**

WRI GHG Protocol

### **Comment**

### **Jet Kerosene**

### **Emission factor**

252

### **Unit**

kg CO2 per MWh

### **Emission factor source**

WRI GHG Protocol

### **Comment**

### **Methane**

### **Emission factor**

202

### **Unit**

kg CO2 per MWh

### **Emission factor source**

WRI GHG Protocol

### **Comment**

Methane used for combustion. Natural gas emission factor is used.

### **Natural Gas**

### **Emission factor**

202

### **Unit**

kg CO2 per MWh

### **Emission factor source**

WRI GHG Protocol

### **Comment**

### **Petrol**

### **Emission factor**

249

### **Unit**

kg CO2 per MWh

### **Emission factor source**

WRI GHG Protocol

### **Comment**

### **Propane Gas**

### **Emission factor**

227

### **Unit**

kg CO2 per MWh

### **Emission factor source**

WRI GHG Protocol

### **Comment**

## **C8.2f**

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

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

Contract with suppliers or utilities (e.g. green tariff), not supported by energy attribute certificates

### **Low-carbon technology type**

Hydropower

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

77806

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

0.522

### **Comment**

Most of PACCAR's renewable electricity consumption is in the Netherlands. Only 181 MWh of the total 77,806 MWh of renewable electricity consumed by PACCAR in 2017 is from outside of the Netherlands. However, due to the lack of CDP acceptable certifications, low-carbon emissions factors are not used by PACCAR in CDP reporting of greenhouse gas emissions. The location specific emission factor for the Netherlands is provided in this table and is used for calculating CO2 emissions for CDP reporting except for the 181 MWh’s of green energy consumed in Germany. The country specific emission factor for Germany is used for the 181 MWh’s of green energy consumed in Germany.

## **C-TO8.4**

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

### **Activity**

Heavy Duty Vehicles (HDV)

### **Metric figure**

1.7

### **Metric numerator**

tCO2e

### **Metric denominator**

Production: Vehicle

### **Metric numerator: Unit total**

275463

### **Metric denominator: Unit total**

158900

### **% change from previous year**

-13

### **Please explain**

PACCAR's 2017 global greenhouse gas emissions intensity per unit delivered decreased 13% from 2 tonnes CO2 per unit delivered in 2016 to 1.7 tonnes CO2 per unit delivered in 2017. Although PACCAR's global production rate increased by 13% in 2017, global greenhouse gas emissions decreased 2% between 2016 and 2017 on an absolute basis due to a focus on energy reduction investments and behaviors. The reduction in CO2 intensity is calculated by dividing the difference between the 2016 and 2017 greenhouse gas emissions by the units delivered each year, respectively, and then dividing that difference by the emissions intensity per unit delivered in 2016. ((279,717 tonnes/140,900 units) - (275,463 tonnes/158,900 units))/(279,717 tonnes/140,900 units)).

## **C9. Additional metrics**

## **C9.1**

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

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

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

### **Activity**

Heavy Duty Vehicles (HDV)

### **Metric**

Sales

### **Technology**

Vehicle using LPG/CNG

### **Metric figure**

1.5

### **Metric unit**

% of total sales

### **Explanation**

PACCAR is the market leader for alternative technology heavy-duty vehicles. Based on the latest information from the U.S. Energy Information Administration (EIA), PACCAR provided over 40% of all CNG/LPG/LNG medium and heavy-duty vehicles in the US in 2016 through its Peterbilt and Kenworth Divisions. EIA 2017 figures for the total U.S. market for alternative fuel medium and heavy-duty vehicles are not yet available. In 2017, PACCAR sold even more CNG vehicles than in 2016. In 2017, 1.5% of the PACCAR's global sales were CNG heavy-duty vehicles.

### **Activity**

Heavy Duty Vehicles (HDV)

### **Metric**

Sales

### **Technology**

Vehicle using bio-fuel

### **Metric figure**

26

### **Metric unit**

% of total sales

### **Explanation**

In 2017, DAF introduced MX 13 and MX 11 engines that are certified to use B10/B20/B30 and XTL biofuels in Europe and B20 in the U.S. including renewable fuels. Biofuel capable unit sales represents 26% of PACCAR's total global truck sales.

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

### **(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**

Heavy Duty Vehicles (HDV)

### **Investment start date**

January 1 2017

### **Investment end date**

December 31 2017

### **Investment area**

R&D

### **Technology area**

Electrification

### **Investment maturity**

Pilot demonstration

### **Investment figure**

1021000

### **Low-carbon investment percentage**

0-20%

### **Please explain**

PACCAR's 2017 research and development investment in low-carbon transitioning included more than $1 million in several field tests, demonstration and development projects for electrification of PACCAR's nameplates Kenworth, Peterbilt and DAF road freight vehicles including parallel hybrids, range extending hybrids and battery based accessory drive hybrids. PACCAR's 2017 low-carbon investments also focused on battery electric demonstration vehicle development for DAF, Kenworth and Peterbilt.

## **C10. Verification**

## **C10.1**

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

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

## **C10.1a**

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

### **Scope**

Scope 1

### **Verification or assurance cycle in place**

Annual process

### **Status in the current reporting year**

Complete

### **Type of verification or assurance**

Limited assurance

### **Attach the statement**

[PACCAR 2017 GHG Emissions - Verification Statement Letter\_Deliverables.pdf](https://www.cdp.net/en/formatted_responses/files?file_path=k9me76vz7u2sozvqoi2gbw-cdp-credit360-com/a0PgiLtJsECARNFygxkk3Q/PACCAR2017GHGEmissionsVerificationStatementLetterDeliverables.pdf)

### **Page/ section reference**

pages 2 and 3

### **Relevant standard**

ISO14064-3

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

74

### **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**

[PACCAR 2017 GHG Emissions - Verification Statement Letter\_Deliverables.pdf](https://www.cdp.net/en/formatted_responses/files?file_path=k9me76vz7u2sozvqoi2gbw-cdp-credit360-com/a0PgiLtJsECARNFygxkk3Q/PACCAR2017GHGEmissionsVerificationStatementLetterDeliverables.pdf)

### **Page/ section reference**

pages 2 and 3

### **Relevant standard**

ISO14064-3

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

94

## **C10.1b**

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

### **Scope**

Scope 3- at least one applicable category

### **Verification or assurance cycle in place**

Annual process

### **Status in the current reporting year**

Complete

### **Attach the statement**

[PACCAR 2017 GHG Emissions - Verification Statement Letter\_Deliverables.pdf](https://www.cdp.net/en/formatted_responses/files?file_path=k9me76vz7u2sozvqoi2gbw-cdp-credit360-com/a0PgiLtJsECARNFygxkk3Q/PACCAR2017GHGEmissionsVerificationStatementLetterDeliverables.pdf)

### **Page/section reference**

pages 2 and 3

### **Relevant standard**

ISO14064-3

## **C10.2**

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

No, but we are actively considering verifying within the next two years

## **C11. Carbon pricing**

## **C11.1**

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

Yes

## **C11.1a**

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

EU ETS

## **C11.1b**

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

### **EU ETS**

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

16

### **Period start date**

January 1 2017

### **Period end date**

December 31 2017

### **Allowances allocated**

13412

### **Allowances purchased**

0

### **Verified emissions in metric tons CO2e**

17792

### **Details of ownership**

Facilities we own and operate

### **Comment**

## **C11.1d**

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

The strategy is to reduce emissions by reducing consumption of energy, and purchasing credits if needed, or if the market circumstances are profitable to do so. The storage of unused allowances will be used in the EU-ETS 2013-2020 trading period. Energy conservation is pursued using energy management systems and the systematic replacement of process equipment with higher energy efficient models.

## **C11.2**

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

Yes

## **C11.2a**

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

### **Credit origination or credit purchase**

Credit origination

### **Project type**

Transport

### **Project identification**

PACCAR is subject to EPA’s Heavy Duty Vehicle and Engine Greenhouse Gas (GHG) regulatory program, as well as Environment and Climate Change Canada’s (ECCC) regulations for engines and vehicles produced by PACCAR Engine Company, and PACCAR divisions: Kenworth and Peterbilt. The U.S. regulations are found in 40 CFR 1036 for engines and 40 CFR 1037 for vehicles. PACCAR generates credits by exceeding the applicable standards in any given model year. In 2017, PACCAR created the following CO2 credits: Engine credits: US = 725,855 tonnes; Canada = 183,913 tonnes, Vehicle credits: US = 816,514 tonnes; Canada = 14,024 tonnes. PACCAR also retired unused credits from 2013 amounting to the following: Retired engine credits: US = 36,406; Canada = 24,036 tonnes. Credits were retired because they had reached the end of their useful life and were not used by PACCAR.

### **Verified to which standard**

Other, please specify (40 CFR 1036 and 40 CFR 1037 )

### **Number of credits (metric tonnes CO2e)**

1740306

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

1740306

### **Credits cancelled**

No

### **Purpose, e.g. compliance**

Voluntary Offsetting

## **C11.3**

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

Yes

## **C11.3a**

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

### **Objective for implementing an internal carbon price**

Drive energy efficiency

### **GHG Scope**

Scope 1

Scope 2

Scope 3

### **Application**

Capital budget allocation process.

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

1

### **Variance of price(s) used**

1 for 1 based on tonnes of CO2 emissions associated with capital investments, and either positive for increases in CO2 emissions or negative for decreases in CO2 emissions.

### **Type of internal carbon price**

Shadow price

### **Impact & implication**

PACCAR's internal capital budgeting process requires all project funding requests to estimate the resulting changes to CO2 emissions for both facilities and product-use projects as part of the approval process. These changes to CO2 emissions result in a second return on investment for each project using the CO2 emissions changes as the shadow price which can be either positive for decreasing emissions or negative for increasing emissions to better inform decision making in the context of CO2 emissions reduction goals. PACCAR's internal approval ROI threshold is higher than many energy efficiency related projects can achieve allowing the second carbon price return to help otherwise marginal investment, by PACCAR's standards, gain approval.

## **C12. Engagement**

## **C12.1**

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

Yes, our suppliers

Yes, our customers

Yes, other partners in the value chain

## **C12.1a**

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

### **Type of engagement**

Innovation & collaboration (changing markets)

### **Details of engagement**

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

### **% of suppliers by number**

5

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

83

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

86

### **Rationale for the coverage of your engagement**

PACCAR is driven to provide its customers with the highest quality truck with the lowest lifetime operating costs especially related to fuel economy, safety, reduced emissions and next generation transport technology. PACCAR challenges all suppliers to improve fuel efficiency and reduce greenhouse gas emissions using cutting-edge technology. Active collaboration with the top 100 suppliers, which accounts for 83% of PACCAR's total spend, is strategically focused on those suppliers who can best contribute to fuel economy improvements and reduced emissions.

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

Success is measured by the improvement in fuel economy and reduction of greenhouse gas emissions from PACCAR's trucks. For example, successful engagement with suppliers, customer and partners resulted in PACCAR's success in reducing greenhouse gas emissions intensity in trucks sold in North American in 2017 by 21.9% over the 2010 baseline. An example of collaboration and innovation in 2017 is the successful development of a prototype Kenworth T680 natural gas powered hybrid-electric truck. Suppliers Cummins and BAE Systems collaborated with PACCAR to achieve 30-mile zero emissions range using lithium-ion batteries with the Kenworth T680 hybrid electric truck. When the batteries are depleted, the near-zero emissions natural gas engine turns on to generate more energy and extend the truck's range up to 250 miles.

### **Comment**

## **C12.1b**

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

### **Type of engagement**

Education/information sharing

### **Details of engagement**

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

### **Size of engagement**

100

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

86

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

PACCAR provides information and training to all customers to optimize fuel economy and reduce greenhouse gas emissions of PACCAR’s nameplate DAF, Peterbilt and Kenworth trucks because the driver’s skills in using PACCAR advanced vehicles can reduce transport related greenhouse gas emissions significantly. PACCAR offers all customers driver training through instructional videos, hands-on classroom Driver Academy and in-vehicle driver information centers to reduce fuel consumption, reduce CO2 emissions, improve vehicle reliability, driver productivity, and enhance the health and safety of the driver and the environment. For example, at the start of the DAF EcoDrive training the driver is challenged to show his or her actual driving skills. During the session, time, fuel consumption and DAF Driver Performance Assistant scores are monitored. In the second stage of training, the driver receives all the theoretical information on how to make optimum use of all the DAF truck systems that enable him or her to drive as economically as possible. The final part of the DAF Driver Training is a coached driving session, during which all theoretical information is put into practice and new scores are monitored to show the improvement, which is a measure of success for each driver. Also, the DAF, Kenworth and Peterbilt Driver Performance Assistant offers interactive in-dash coaching for customers to continue improvement in driver skills on-the-job, and to provide real-time truck and fleet information on truck systems that can improve fuel economy including tire pressure, aerodynamic settings of cab roof spoilers, fuel efficient shifting, braking, and predictive cruise control.

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

The skills of drivers of PACCAR's DAF, Kenworth and Peterbilt trucks are key to achieving the highest possible fuel efficiency and reduction of greenhouse gas emissions. The impact of providing driver training to all PACCAR customers in the use of PACCAR’s advance vehicles is improved vehicle reliability, increased driver productivity, enhanced driver safety, better fuel economy, reduced operating expense, and reduced vehicle emissions including greenhouse gas emissions. The measure of success is the fuel efficiency increase and operational safety improvement for our customers. For example, the DAF EcoDrive Training supports the driver in handling the truck in the most efficient way using the latest on-board technologies resulting in 3 to 5% better fuel economy and lower emissions from every properly trained driver. Customer surveys track customer satisfaction including training impacts. One customer recently noted, “The [dashboard] driver [Performance] assist provides feedback to our drivers wherever they go, so we don’t have to ride along with them to evaluate their driving. It offers them guidance in situations as they happen. We think that’s a much more effective way for drivers to learn how to improve their driving. It can advise them when to shift to get optimum fuel economy. The performance assist coupled with the Kenworth T680’s aerodynamics and fuel efficiency of the PACCAR MX-engine, have all contributed to the T680 delivering an average 1.2 mpg improvement in fuel economy over the other trucks in our fleet. That’s a 21 percent improvement in fuel economy performance.”

## **C12.1c**

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

PACCAR pursues multi-stakeholder opportunities for collaboration to both expedite and enhance advances in road freight including vehicle electrification, improved fuel economy, zero-emissions, autonomous and advanced driver assistance technologies. As an example, in 2017 Kenworth, a division of PACCAR, announced that it will collaborate with the Department of Energy, Mississippi State University, the National Renewable Energy Laboratory, Eaton, AVL and UPS to develop important advancements in Class 8 truck aerodynamics, engine and powertrain efficiencies as part of the DOE SuperTruck II Project. The PACCAR Technical Center and DAF Trucks, a subsidiary of PACCAR will also participate. The project will utilize Kenworth's T680 highway flagship tractor and the fuel-efficient PACCAR MX engine. The project's target goals include the demonstration of greater than 100 percent improvement in freight efficiency over the 2009 equivalent model and achieving 55 percent engine brake thermal efficiency. This initiative will support Kenworth’s customer, UPS, achieve its sustainability commitment to reduce absolute greenhouse gas emissions from global operations 12 percent by 2025. In Silicon Valley, PACCAR’s new Innovation Center is fostering relationships with a host of start-up suppliers and customers through open houses, multi-stakeholder meetings and workshop forums to foster collaboration on the next generation of vehicle advances.

## **C12.3**

### **(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?**

Direct engagement with policy makers

Trade associations

## **C12.3a**

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

|  |  |  |  |
| --- | --- | --- | --- |
| **Focus of legislation** | **Corporate position** | **Details of engagement** | **Proposed legislative solution** |
| Other, please specify (Fuel Efficiency and emissions) | Support | Direct engagement with the Department of Energy, National Highway Traffic Safety Administration, US EPA, Environment Canada, California Air Resources Board and the European Parliament in developing fuel efficient freight transport. | Improving fuel economy and the commercialization of alternate fuels helps PACCAR’s customers reduce costs and impacts on the environment. Transport emissions regulations should be harmonized internationally to cost effectively broaden the environmental benefit. |

## **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**

Engine Manufacturers Association (EMA)

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

Consistent

### **Please explain the trade association’s position**

The Engine Manufacturers Association works cooperatively with regulatory agencies, including the US Environmental Protection Agency (EPA), the California Air Resources Board (ARB), the National Highway Transportation Safety Administration (NHTSA), state governments and international regulatory agencies to develop and implement cost-effective and technologically feasible emissions, fuel efficiency and safety regulations that result in fewer emissions, better fuel efficiency, and enhanced safety.

### **How have you, or are you attempting to, influence the position?**

PACCAR contributes to EMA’s focus and outreach on globally consistent policy and regulatory development addressing commercial transport fuel efficiency, low carbon fuels and emissions including particulate and greenhouse gas emissions.

### **Trade association**

European Automobile Manufacturer’s Association (ACEA)

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

Consistent

### **Please explain the trade association’s position**

The commercial vehicle industry is committed to sustainable transport. ACEA supports the European Commission's proposal for required monitoring and reporting of CO2 emission and fuel consumption of new heavy-duty vehicles. Fuel consumption information is key to enabling vehicle operators to make well-informed purchasing decisions. GHG reductions can be achieved with policies and local action to improve traffic flow, investments in intelligent infrastructure, and better intermodal logistics. ACEA provided the Commission with 10 key recommendations for successful development of CO2 standards for heavy-duty vehicles including consistency with other emissions regulations and metrics, focus on entire vehicle, not just components, incentivize the transition, utilize banking and trading mechanisms, and set targets for 2025 and 2030.

### **How have you, or are you attempting to, influence the position?**

Through DAF, PACCAR contributes to ACEA’s policy and regulatory outreach on the sustainability of commercial transport including greenhouse gas emissions.

## **C12.3f**

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

PACCAR's policy engagement and lobbying activity at the local, state, regional, and national level are centrally managed by region. For example, in the U.S., PACCAR’s public affairs office in Washington, D.C. reports to the corporate General Counsel to insure consistent alignment with overall business strategy including climate related priorities. In the EU, DAF engages in climate policy outreach through the European Automobile Manufacturer’s Association (ACEA) and reports to PACCAR's President. Both PACCAR's President and General Counsel are members of PACCAR's operating committee ensuring consistent climate strategy.

## **C12.4**

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

### **Publication**

In mainstream reports

### **Status**

Complete

### **Attach the document**

[paccar-2017-annual-report.pdf](https://www.cdp.net/en/formatted_responses/files?file_path=k9me76vz7u2sozvqoi2gbw-cdp-credit360-com/lKY0q_NUYky2m8HH-OBIjw/paccar2017annualreport.pdf)

### **Content elements**

Strategy

Risks & opportunities

Emissions figures

Emission targets

### **Publication**

In voluntary communications

### **Status**

Complete

### **Attach the document**

[Screenshot for CDP 2018.JPG](https://www.cdp.net/en/formatted_responses/files?file_path=k9me76vz7u2sozvqoi2gbw-cdp-credit360-com/uNtk3VKT-Eu8R-ILZMmOXA/ScreenshotforCDP2018.JPG)

### **Content elements**

Emissions figures

Emission targets

## **C14. Signoff**

## **C-FI**

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

## **C14.1**

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

|  |  |  |
| --- | --- | --- |
|  | **Job title** | **Corresponding job category** |
| Row 1 | Vice President | Other, please specify (VIce President) |