

## C0. Introduction

---

## C0.1

---

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

Founded in 1870 by George H. Tennant, Tennant Company, a Minnesota corporation incorporated in 1909, began as a one-man woodworking business, evolved into a successful wood flooring and wood products company, and eventually into a manufacturer of floor cleaning equipment. Throughout its history, Tennant has remained focused on advancing our industry by aggressively pursuing new technologies and creating a culture that celebrates innovation.

Today, Tennant Company is a recognized leader of the cleaning industry. We are passionate about developing innovative and sustainable solutions that help our customers clean spaces more effectively, addressing indoor and outdoor cleaning challenges. Tennant Company operates in three geographic business units including the Americas, Europe, Middle East and Africa (EMEA) and Asia Pacific (APAC).

Tennant Company is committed to empowering our customers to create a cleaner, safer and healthier world with high-performance solutions that minimize waste, reduce costs, improve safety and further sustainability goals.

The Company offers products and solutions consisting of mechanized cleaning equipment, detergent-free and other sustainable cleaning technologies, aftermarket parts and consumables, equipment maintenance and repair service, specialty surface coatings, and business solutions such as financing, rental and leasing programs, and machine-to-machine asset management solutions.

The Company's products are used in many types of environments including: Retail establishments, distribution centers, factories and warehouses, public venues such as arenas and stadiums, office buildings, schools and universities, hospitals and clinics, parking lots and streets, and more. The Company markets its offerings under the following brands: Tennant®, Nobles®, Alfa Uma Empresa Tennant™, Superior Anodes, Waterstar and Orbio®. Orbio Technologies, which markets and sells Orbio-branded products and solutions, is a group created by the Company to focus on expanding the opportunities for the emerging category of On-Site Generation (OSG). OSG technologies create and dispense effective cleaning and antimicrobial solutions on site within a facility. Customers include contract cleaners to whom organizations outsource facilities maintenance, as well as businesses that perform facilities maintenance themselves. The Company reaches these customers through the industry's largest direct sales and service organization and through a strong and well-supported network of authorized distributors worldwide.

In April 2017, the Company completed its acquisition of the IPC Group business ("IPC"). IPC manufactures a complete range of commercial cleaning products including mechanized cleaning equipment, wet & dry vacuum cleaners, cleaning tools & carts and high-pressure washers. These products are sold into similar vertical market applications as those listed above, but also into office cleaning and hospitality vertical markets through a global direct sales and service organization and network of distributors. IPC markets products and services under the following valued brands: IPC, Gansow, Vaclensa, Portotecnica, Soteco and private-label brands.

IPC business activity is not included in emissions reported for 2017. See Question 6.4a for more information.

Form 10-K (Annual Report) filed February 28, 2018, for the period January 1, 2017 to December 31, 2017 is available here:

<http://investors.tennantco.com/reports/sec-filings/sec-filings-details/default.aspx?FilingId=12585706>

---

## **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	Yes	2 years
Row 2	January 1 2016	December 31 2016	<Not Applicable>	<Not Applicable>
Row 3	January 1 2012	December 31 2012	<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  
Brazil  
Canada  
China  
France  
Germany  
Italy  
Japan  
Mexico  
Netherlands  
Portugal  
Spain  
United Kingdom of Great Britain and Northern Ireland  
United States of America

**C0.4**

---

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

USD

**C0.5**

---

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

Operational control

**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)	As leader of Tennant Company, the CEO is ultimately responsible for overall financial, environmental, and social governance of the business including climate-related issues. The CEO is also a member of the Board of Directors. The Sustainable Enterprise group reports directly to the CEO. The CEO provides required oversight for the Sustainable Enterprise group and also advocates for action toward climate-related objectives and goals across all business units and functional groups which comprise the business. The Sustainable Enterprise group is responsible for setting and making progress toward environmental performance targets. These targets include carbon emission reductions for Scope 1 and 2, along with Scope 3 Category 11 - Use of Sold Products.

## 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 – some meetings	<ul style="list-style-type: none"> <li>Reviewing and guiding strategy</li> <li>Reviewing and guiding risk management policies</li> <li>Reviewing and guiding annual budgets</li> <li>Overseeing major capital expenditures, acquisitions and divestitures</li> </ul>	The CEO and Senior Management Team prepare and present company strategies and the operating plan to the board. Business and functional unit leaders also present specific elements of strategy and plans. As part of this annual planning cycle, consideration is given to whether initiatives match up with our Stewardship core value when setting the plan. The board review includes strategies, objectives and budgets. The board guides the strategy and approves the operating plan. Strategy reviews are typically scheduled for the August board meeting, but also as important matters arise. Operating plan review and approval is typically completed at the December board meeting. The board reviews the annual Enterprise Risk Assessment (ERA) process which identifies, defines, and ranks the company's annual risks. The ERA review is scheduled for the December board meeting. The board monitors progress toward specific risk mitigation action plans. In 2017, six of the thirteen key business risks mapped to Sustainable Enterprise, which was one of our 2017 strategic goals. The board also oversees and approves major capital expenditures, acquisitions and divestitures. For example, a major capital project related to electrical service for the Minneapolis manufacturing facility was reviewed and approved in Q4 2017. Completion of this project in 2018 will provide substantial energy savings and enable additional efficiency investments. When the board reviews acquisitions, risks related to the acquired venture's properties and other assets are reviewed. This may include vulnerability to extreme weather events and other potential business disruptions connected to long-term climate change. Board oversight of major capital expenditures, acquisitions and divestitures is scheduled as these important matters arise. An example is the IPC Group acquisition, approved by the board in Q1 2017.

## 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, please specify (Director, Sustainable Enterprise)	Both assessing and managing climate-related risks and opportunities	As important matters arise

## 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.**

The Director, Sustainable Enterprise reports directly to the President and Chief Executive Officer.

Areas of specific responsibility include Tennant Company's Sustainable Enterprise Focus Areas, one of which is Greenhouse Gas (GHG) Emissions & Energy. This Focus Area includes energy efficiency, energy supply arrangements, carbon emissions and emission reduction targets for Scope 1, 2, and 3. Our short- and long-term goals for GHG Emissions/Energy include: 1) broadening and accelerating energy and fuel reduction initiatives; 2) developing and entering into more renewable energy supply arrangements; 3) developing products and technology with reduced environmental impact including carbon emissions; 4) achieving progress toward our approved Science-Based Targets for emission reduction. Progress on all these fronts represents Tennant Company's contribution to mitigation of long-term climate-related risks.

The Sustainable Enterprise (SE) team is also responsible for objectives, goals and metrics in the Products and Waste Focus Areas.

Climate-related issues within Tennant Company are monitored by the SE Director's participation in the annual strategic and operating planning processes, along with engagement on relevant initiatives and projects. Specific examples include reviewing the Annual Operating Plan for climate-related issues addressed by the capital investment profile. Also, CAPEX projects are reviewed in the approval cycle for climate-related issues. For projects applicable to climate-related issues, the carbon emission impacts are quantified.

One way climate-related issues and trends which affect Tennant Company from the outside are monitored is by participation in external organizations. Example organizations include CDP, SBTi, the Minnesota Sustainable Growth Coalition, and the University of Minnesota Institute on the Environment.

The SE team has responsibility for climate-related issues. The company believes these issues require the attention of a team working across all company business units and functions, as well as participating in upper level management processes and meetings. The SE team provides periodic updates to the Senior Management Team and project-specific updates as required. Two specific examples from 2017 are: 1) overview of organizational responsibilities and specific accountability for 2017 goals and objectives in Q1; and 2) reviewing and gaining approval for the science-based target submission package in Q3.

## 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?**

Other, please specify (Director, Sustainable Enterprise)

**Types of incentives**

Monetary reward

**Activity incentivized**

---

Emissions reduction target

#### **Comment**

In 2017 the Director, Sustainable Enterprise had performance goals tied to specific projects in the four Sustainable Enterprise Focus Areas. GHG Emissions/Energy is one Focus Area, along with People and Communities, Products, and Waste. Performance goals are defined annually and reviewed at least quarterly. In 2017, performance goals related to the management of climate-related issues included: - making progress toward the Scope 1+2 intensity target set in 2014 - completing and gaining approval for CDP Climate Change Questionnaire and Supply Chain response - developing Science-Based Targets for Scope 1+2 and Scope 3, Category 11 "Use of Sold Products" - gaining internal approval and submitting the targets for SBTi review (NOTE: SBTi approval was received in early 2018) - presenting the Sustainable Enterprise strategy at Global Supplier Summit (Jan 2017) and engaging supply chain partners - continuing the "energy champions" program - evaluating renewable energy options for US-based facilities and signing one new purchasing agreement - continuing existing renewable energy agreements in the Netherlands - preparing internal accounting processes for renewable electricity tied to electrical use at our two primary Minneapolis facilities. Supply agreements in the form of Community Solar Garden (CSG) subscriptions were signed in 2016. These CSGs began to come on-line in late 2017 and provide additional renewable capacity on the grid. Renewable Energy Certificates (RECs) for electricity generated by these CSGs go to the local, fully regulated utility - Xcel Energy. More detail on these and other projects appears throughout this response.

---

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

All employees

#### **Types of incentives**

Monetary reward

#### **Activity incentivized**

Other, please specify (Stewardship -Reduce environmental impact)

#### **Comment**

The APPLAUSE program rewards employees for going above and beyond their assigned duties or tasks. One APPLAUSE award category is 'Stewardship,' which is one of Tennant Company's core values and one of nine Guiding Principles. We define Stewardship as leaving things in better condition than when we found them. In 2017, more than 350 employees received monetary rewards for Stewardship via APPLAUSE. Total value of these awards was more than \$45,000. Two awards were given for work related to data assumptions used to complete the 2017 CDP Questionnaire. This work ensured we accurately reported our carbon emissions, per The Greenhouse Gas Protocol.

---

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

All employees

#### **Types of incentives**

Recognition (non-monetary)

#### **Activity incentivized**

Other, please specify (Stewardship -Reduce environmental impact)

#### **Comment**

Our annual Leading Edge program recognizes employees who have made significant contributions toward Tennant Company's Strategic Priorities. There are five Leading Edge award categories, including 'Stewardship,' one of our core values and one of nine Guiding Principles. We define Stewardship as leaving things in better condition than when we found them. Over the years, Leading Edge awards have recognized employees who develop innovative products with reduced environmental footprint; minimize or reduce GHG emissions, energy consumption, and costs; reduce waste; and make positive contributions in our communities. Twenty-six (26) employees were recognized under Leading Edge for this reporting year. One 2017 Leading Edge award went to the Program Manager for IRIS® Asset Manager program. IRIS is an internet-of-things product offering and provides information about remote fielded machines. This information helps customers manage their cleaning operations. IRIS also provides data which can potentially reduce unnecessary service visits and improve the first time fix rate. As the IRIS program proceeds, we expect to see reductions in service fleet vehicle fuel consumption. The avoided emission possibilities with IRIS will help Tennant and our customers reduce risk from climate-related issues. The Leading Edge program is recognition based, but includes an element of reward in the form of a three-day trip with partner/spouse to a destination. The 2017 Leading Edge recognition event was held in Punta Cana, Dominican Republic.

---

## **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	2	
Medium-term	2	3	
Long-term	3	100	

## 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	The monitoring process begins once the annual Enterprise Risk Assessment (ERA) survey, risk prioritization, risk remediation planning, senior management and Board review steps are complete. Risks are monitored and reviewed quarterly. Monitoring continues until the annual ERA update begins again in the fourth quarter. Climate-related risks have short- and long-term implications. Consideration beyond six years is important.

## C2.2b

---

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

Climate-related risks and opportunities are identified and assessed as part of the annual Enterprise Risk Assessment (ERA) process. We do not use a distinct process to identify and assess sub-categories of company and asset level risks.

Tennant Company conducts the ERA each year involving approximately 70 senior management and key employees throughout the world. The ERA is done at the company level by a survey process which includes leaders from all business units (geographic and product type) and functions (Finance, Research and Development, Operations, etc.). The scope of the ERA includes all significant sites or assets. For example, key Operations group employees identify and assess risks associated with individual manufacturing facilities at the asset level (Holland, MI; Limeira, Brazil; Minneapolis, MN; Qingpu, China; and Uden, the Netherlands). The overall process is led by our outsourced Internal Auditor firm, which begins by refreshing the enterprise risk assessment framework. The next step in the risk assessment process involves survey participants being specifically asked to identify the most significant risks to the organization. The prior year risk profile is provided to participants, along with risk assessment criteria, and examples of Strategic, Operations, Compliance and Financial risks.

The ERA currently includes thirteen risk categories, six of which encompass climate-related risks. Climate-related risks and opportunities are identified and embedded within these six ERA risk/opportunity categories. The six categories include Competition, Product Development, Sourcing - Supply Chain, Macroeconomic Environment, Business Continuity Planning, and Non Product Regulatory and Legal Compliance. Within the Competition and Product Development categories, we assess the risks and opportunities around Tennant's commitment to industry innovation leadership and providing products that clean in a more sustainable, environmentally friendly manner. Within Sourcing - Supply Chain and Business Continuity Planning categories we assess the risks associated with extreme weather that could adversely impact our facilities and employees, as well as those of our supply chain partners. Within the Macroeconomic Environment category we assess the positive and negative impact of events which could strengthen or weaken local and global economies. Within the Non Product Regulatory and Legal Compliance categories we assess potential reputation and litigation related risks. We also identify and assess risks and opportunities related to changing regulations that may impact our products. Our products use batteries, engines, and other regulated items which are associated with product use-phase carbon emissions. Our Product Regulatory Group is responsible for monitoring this sub-category of regulatory risks and issues.

We define "substantive financial impact" as an amount greater than 5% of pre-tax income. For 2017, this amount is \$4.44 M.

**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	We include the Current regulation risk type in the Non Product Regulatory and Legal Compliance category of Enterprise Risk Assessment (ERA) process. The current regulation risk type also includes Product Related Regulatory risks. Due to the international scope of our operations, we are subject to a complex system of commercial, tax and trade regulations around the world. Recent years have seen an increase in the development and enforcement of laws regarding carbon taxes and emissions trading schemes (ETS), trade, tax compliance, labor and safety and anti-corruption - for example the United States (US) Foreign Corrupt Practices Act, and similar laws from other countries. Our numerous foreign subsidiaries and affiliates are governed by laws, rules and business practices that differ from those of the US, but because we are a US-based company, oftentimes they are also subject to US laws which can create a conflict. Despite our due diligence, there is a risk that we do not have adequate resources or comprehensive processes to stay current on changes in laws or regulations applicable to us worldwide and maintain compliance with those changes. Increased compliance requirements may lead to increased costs and erosion of desired profit margin. As a result, it is possible that the activities of these entities may not comply with US laws or business practices or our Business Ethics Guide. Violations of the US or local laws may result in severe criminal or civil sanctions, could disrupt our business, and result in an adverse effect on our reputation, business and results of operations or financial condition. We cannot predict the manner in which existing laws might be administered or interpreted.



	Relevance & inclusion	Please explain
Emerging regulation	Relevant, always included	We include the Emerging regulation risk type in the Non Product Regulatory and Legal Compliance category of Enterprise Risk Assessment (ERA) process. The Emerging regulation risk type also includes Product Related Regulatory risks. Due to the international scope of our operations, we are subject to a changing system of commercial, tax and trade regulations around the world. Recent years have seen an increase in the discussion and development of laws regarding carbon taxes and emissions trading schemes, trade, tax compliance, labor and safety and anti-corruption. Increased compliance requirements for Emerging regulation may lead to increased costs and erosion of desired profit margin. We cannot predict the nature, scope or effect of future regulatory requirements to which our operations might be subject. For example, the reformed EU ETS will go into effect in 2021. The IPC Group acquisition in 2017 gave us a much broader set of direct operations in the EU. Considering the implications of reformed EU ETS is planned for 2018-2020, before it goes into effect. We also see Emerging regulation as an area of tremendous opportunity via increased demand for lower emissions products and services.
Technology	Not relevant, explanation provided	No climate-related Technology risk types are currently assessed as relevant. Technological improvements or innovations that support the transition to a lower-carbon, energy-efficient economic system are something we see as an area of tremendous opportunity via increased demand for lower emissions products and services. For example, electrification of our product line portion which employs internal combustion engines is an area of current investment.
Legal	Not relevant, explanation provided	No climate-related Legal risk types are currently assessed as relevant, beyond those mentioned in Current and Emerging regulation risk types. Our business model is develop, manufacture, sell, and service capital goods products. This includes mechanized cleaning equipment, detergent-free and other sustainable cleaning technologies, aftermarket parts and consumables, equipment maintenance and repair service, specialty surface coatings, and business solutions such as financing, rental and leasing programs, and machine-to-machine asset management solutions. We have not identified any climate-related litigation claim risks.
Market	Relevant, always included	We include this risk type in the Competition and Product Development categories of Enterprise Risk Assessment (ERA) process. Climate-related Market risk types may include competitor products and technologies which are market advantaged due to lower carbon emissions or other environmental impact reduction. Our products are sold in competitive markets throughout the world. Competition is based on product features and design, brand recognition, reliability, durability, technology, breadth of product offerings, price, customer relationships and after-sale service. These features can include environmental footprint improvements such as carbon emission reduction. Although we believe that the performance and price characteristics of our products will produce competitive solutions for our customers' needs, our products are generally priced higher than our competitors' products. This is due to our dedication to innovation and continued investments in research and development. We believe that customers will pay for the innovations including environmental benefits (for example the detergent-free Orbio and ec-H2O family of products) and quality in our products. However, it may be difficult for us to compete with lower priced products offered by our competitors and there can be no assurance that our customers will continue to choose our products over products offered by our competitors. If our products, markets and services are not competitive, we may experience a decline in sales volume, an increase in price discounting and a loss of market share, which adversely impacts revenues, margin and the success of our operations.
Reputation	Not relevant, explanation provided	No climate-related Reputation risk types are currently assessed as relevant. Our commitment to science-based targets, demonstrated Scope 1+2 emission reduction progress, and continued investment in eco-advantaged products and technology are examples of how we mitigate this risk type.
Acute physical	Relevant, always included	We include this risk type in the Business Continuity Planning category of Enterprise Risk Assessment (ERA) process. An Acute physical event like a tornado could cause a business disruption. For example, our facilities in Texas and Minnesota are exposed to greater tornado risk compared to our facilities in other US states and countries. While the tornado risk is relatively low, it must be considered. Extreme weather events continue to increase in both severity and frequency. We rely on our computer systems, ERP software such as SAP, manufacturing plants and distribution facilities to efficiently operate our business. If we experience an interruption in the functionality in any of these items for a significant period of time for any reason, including climate-related events, we may not have adequate business continuity planning contingencies in place to allow us to continue our normal business operations on a long-term basis. In addition, the increase in customer-facing technology raises the risk of a lapse in business operations. Therefore, significant long-term interruption in our business could cause a decline in sales, an increase in expenses and could adversely impact our financial results.
Chronic physical	Not relevant, explanation provided	We do not believe any of our direct operations are located in high-risk areas from the Chronic physical risk type perspective. For example, no manufacturing or logistics facilities are located in low sea level or subsidence-prone areas. Longer-term shifts in climate patterns (e.g., sustained higher temperatures) that may cause sea level rise or chronic heat waves are not currently as likely to affect our locations as Acute physical risks. This assessment could change over time, so Chronic physical risk types must be reviewed for relevance on an ongoing basis.
Upstream	Relevant, always included	We include this risk type in the Sourcing - Supply Chain category of our Enterprise Risk Assessment (ERA) process. The Upstream risk type could be realized from a number of the different underlying risk types above including Emerging Regulation, Technology, Legal, Market, Reputation, Acute physical, and Chronic physical. For example, if an Acute physical event occurred at a supplier location, that could create material or part shortages. This in turn could affect our ability to manufacture complete products and deliver to customers on a timely basis, which may in turn have a negative impact on revenue and/or profit, reputation, operations, and overall financial condition.
Downstream	Not relevant, explanation provided	No climate-related Downstream risk types are currently assessed as relevant. Our downstream value chain involves customers using Tennant's capital goods products and solutions to clean industrial and commercial surfaces. We see an opportunity for more frequent sales and use of these products, if and when acute or chronic physical risks are realized by our customers.

## C2.2d

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

Our process for managing climate-related risks and opportunities is dovetailed with the Enterprise Risk Assessment (ERA) process. The Tennant Risk Committee reviews the annual ERA survey results, including prioritization and comments provided by all participants, to confirm or adjust risk prioritization. Prioritization takes the following significance factors into account: 1) Impact (financial, operational/technology, disruption, compliance and strategic/reputational perspectives); 2) Likelihood; and 3) Management Preparedness. Risks are first mapped by Impact and Likelihood, before considering our controls and control environment, i.e. management preparedness, to define the inherent risk profile. Next, our controls and control environment are considered to define the residual risk profile. Responsibility for each risk is assigned to the appropriate senior management team member(s). Remediation plans and action plans are then developed or updated with a goal of mitigating risk exposures.

The completed ERA is approved by senior management, presented to and reviewed by the Board of Directors Audit Committee each December, and a copy is provided to the full Board of Directors. All Board Members are invited to attend this meeting and typically all attend. The ERA and progress against remediation action plans are reviewed each quarter. Any significant changes in the ranking of risks, mitigation efforts, or identification of new risks are discussed with the Board of Directors Audit Committee and provided to the full Board of Directors. Comparing our 2017 and 2016 inherent risk profiles (Impact and Likelihood), we have made measurable mitigation progress.

The company manages climate-related and other risks in many ways outside of the ERA. A good example of how we manage Physical risk is the use of site-specific business continuity plans (BCP). A BCP provides the recovery path should an Acute physical risk like an extreme weather event be realized. These events can be caused or amplified by climate change. Initial response is known to be a key success determinant in mitigating risk. For example, an extreme weather event at our Minneapolis manufacturing facility would invoke a prepared set of initial response actions by specific action owners.

Examples of how we manage Transition risks include our Product Regulatory Group and Senior Product Stewardship Engineer. The Product Regulatory Group monitors and anticipates regulations which currently affect our product categories or could in the future. A number of environmental regulations apply to our product categories like engine emissions, product take-back (recycling), etc. The Product Regulatory Group helps anticipate needed compliance actions before the regulations take effect. This group also influences the product development road map, which outlines future resource commitments against opportunities. The Senior Product Stewardship Engineer works closely with the Research and Development group on technology risks. The goal is to turn technology risks into opportunities. Electrification is a good example. We have been shifting our product lines away from internal combustion and toward battery power for many years. Advances in battery technology like lithium-ion provide a future growth opportunity.

Climate-related opportunities are also managed through our Strategic Planning and Business Development processes and the Advanced Products and Technology Group. We consider potential investments and acquisitions which will enable future growth. Monitoring general technology trends plus adjacent industry trends is a mechanism we use to manage such opportunities. Once identified, we closely watch technologies with potential to reduce environmental impact of our products. One example is the general desire for many customers to reduce Scope 1+2 carbon emissions. We have conducted Life-Cycle Assessments on several of our products. We partner with existing and potential customers to determine how much they can reduce emissions by adapting our new products and technologies.

With a premium, lowest total cost product line we serve customers that seek to reduce their environmental impacts and related risks.

## **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) 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?**

Supply chain

**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**

RoHS, REACH and pending rules from the EPA and similar regulatory agencies in our key markets may affect internal combustion engines, fuel delivery systems and/or batteries used in our products. These rules and regulations have the potential to impact the sale of our products. These regulations also have the potential to impact material selection and costs. These risks apply to all products and all manufacturers in certain industries. The financial impact could be lost sales, along with both cost of compliance and opportunity cost from diversion of key resources from new product development to compliance programs.

**Time horizon**

Long-term

**Likelihood**

About as likely as not

**Magnitude of impact**

Medium

**Potential financial impact**

1000000

**Explanation of financial impact**

Overall revenue could be affected by as much or more than \$1,000,000. Financial impact would depend on mandate and/or regulation specifics, product elements affected and number of models affected. For example, a \$1,000,000 revenue impact could arise if we sell 40 fewer \$25,000 list price products. This could happen if cost increases driven by regulation compliance were too high. Customers may decide to temporarily forego equipment updates by repairing or choose to rent equipment for the short term.

**Management method**

Our Director of Product Regulatory Affairs, along with staff members, address product regulatory issues in all regions in which we conduct business. Our management method to address this risk is active engagement. We strive to understand potential regulatory implications well before they take effect. By proactively engaging, alternatives can be developed and tested, before the regulatory change takes effect. This ensures compliance and reduced risk across our value chain. Product Regulatory Affairs personnel are also involved in each product development project, as well as the governance of our product development process and roadmap. This provides long-term regulatory insight to the product planning process and roadmap. For example, some of our products employ lithium-ion batteries, which are subject to evolving regulations related to risk and safety. We developed internal practices for lithium-ion battery shipping, handling and disposal. Battery-related risks affect a large number of our product models, for example T300, T500, T12, T16, etc. Another example is the difference in engine emission regulations by country/region. By monitoring these evolving regulations, we ensure our products are compatible with engines that are compliant and available in the broadest markets. This risk affects a number of our product models including M20, T20, M30, S20 (some variants), S30, 4300, 800 and Sentinel.

**Cost of management**

200000

**Comment**

Cost of management depends on scope of mandate and/or regulatory change

---

**Identifier**

Risk 2

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

---

Supply chain

**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**

Internal combustion engine emissions regulations. Some of our products employ internal combustion power sources. These products include larger, industrial application types such as Tennant M20, T20, M30, S20 (some variants), S30, 4300, 800 and Sentinel. Engine regulations differ by country and market. The financial impact could be lost sales, along with both cost of compliance and opportunity cost from diversion of key resources from new product development to compliance programs.

**Time horizon**

Short-term

**Likelihood**

Very likely

**Magnitude of impact**

Medium

**Potential financial impact**

1000000

**Explanation of financial impact**

Overall revenue could be affected by as much or more than \$1,000,000. Financial impact would depend on mandate and/or regulation specifics, product elements affected and number of models affected. For example, a \$1,000,000 revenue impact could arise if we sell 10 fewer \$100,000 list price products such as the Sentinel sweeper. This could happen if cost increases driven by regulation compliance were too high. Customers may decide to temporarily forego equipment updates by repairing or choose to rent equipment for the short term. Since internal combustion engine regulations differ by country and market, it can be difficult to maintain a competitive presence in all markets.

**Management method**

Additional product unit cost could result from internal combustion regulation changes. We actively manage our product costs including the cost of compliance with emissions regulations. Our management method is to seek cost-reduction ideas and concepts to partially or fully offset added costs from more complex internal combustion systems. For example, if a regulatory-driven change causes a \$50 increase in product cost, we would review product design in depth to seek offsetting cost reductions. A more expensive air pollution control system could be offset by improved production efficiency from lean manufacturing or other continuous improvement initiatives. This risk affects a number of our product models including M20, T20, M30, S20 (some variants), S30, 4300, 800 and Sentinel.

**Cost of management**

100000

**Comment**

No additional direct cost

**Identifier**

Risk 3

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

Direct operations

**Risk type**

Transition risk

**Primary climate-related risk driver**

Policy and legal: Increased pricing of GHG emissions

**Type of financial impact driver**

Policy and legal: Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

**Company- specific description**

There are externalized, societal costs from the use of fossil fuels. Explicit carbon pricing (carbon tax) along with cap and trade have

been implemented in some markets around the world to address these externalities. We expect this trend to continue. The International Energy Agency (IEA) has estimated \$63 mT CO<sub>2</sub> and \$140 mT CO<sub>2</sub> for 2025 and 2040 respectively in advanced economies. [http://www.iea.org/media/weowebiste/2017/Chap1\\_WEO2017.pdf](http://www.iea.org/media/weowebiste/2017/Chap1_WEO2017.pdf) Our largest manufacturing facilities are located in advanced economies such as the Netherlands and USA. These facilities use substantial electricity and natural gas. We have direct Sales and Service operations in many more advanced economies such as Canada, France, Germany, Japan and Spain. These operations have vehicle fleets which use substantial fuel. This overall risk has direct and indirect (supply chain and client) implications. Risk 3 captures the direct operations portion of the risk.

**Time horizon**

Long-term

**Likelihood**

About as likely as not

**Magnitude of impact**

High

**Potential financial impact**

4265240

**Explanation of financial impact**

From more than \$1,900,000 to more than \$4,265,000 in operational cost. This impact estimate is based on 2017 total Scope 1+2 GHG emissions (market-based) of 30,466 mT CO<sub>2</sub>e and IEA 2025 and 2040 carbon price estimates in advanced economies.  
 $\$1,919,358 = 30,466 * \$63$   $\$4,265,240 = 30,466 * \$140$

**Management method**

Our management approach to this risk is monitoring utility usage by facility and focusing more effort on emissions reduction activities and energy supply projects. Benefits include reduced current operating costs and mitigating the longer term risk. For example, we achieved 2,034 mT CO<sub>2</sub>e absolute emission reduction in 2017, 6.3% less than 2016 emissions. As another example, our emissions reduction activity pipeline ("implementation commenced" + "to be implemented" phases) stands at 5,328 mT CO<sub>2</sub>e (as reported this year).

**Cost of management**

0

**Comment**

No additional direct cost

**Identifier**

Risk 4

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

Supply chain

**Risk type**

Transition risk

**Primary climate-related risk driver**

Policy and legal: Increased pricing of GHG emissions

**Type of financial impact driver**

Policy and legal: Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

**Company- specific description**

There are externalized, societal costs from the use of fossil fuels. Explicit carbon pricing (carbon tax) along with cap and trade have been implemented in some markets around the world to address these externalities. We expect this trend to continue. The International Energy Agency (IEA) has estimated \$63 mT CO<sub>2</sub> and \$140 mT CO<sub>2</sub> for 2025 and 2040 respectively in advanced economies . [http://www.iea.org/media/weowebiste/2017/Chap1\\_WEO2017.pdf](http://www.iea.org/media/weowebiste/2017/Chap1_WEO2017.pdf) This overall risk has direct and indirect (supply chain and client) implications. Risk 4 captures the indirect portion of the risk.

**Time horizon**

Long-term

**Likelihood**

About as likely as not

**Magnitude of impact**

High

**Potential financial impact**

15560000

**Explanation of financial impact**

From more than \$7,000,000 to more than \$15,560,000 in operational cost. This impact estimate is based on 2017 total Scope 3, Category 1 emissions of 111,145 mT CO<sub>2</sub>e and IEA 2025 and 2040 carbon price estimates in advanced economies.  $\$7,002,135 = 111,145 * \$63$   $\$15,560,300 = 111,145 * \$140$

**Management method**

We manage this risk via dialog with our suppliers. For example, we held a Supplier Summit in Minneapolis, Minnesota, on 9-10 January 2017. The event included participants from more than 10% of our global suppliers, representing approximately 80% of global supplier spend. The Summit included a presentation to all attendees on Tennant's Sustainable Enterprise strategy. The presentation included facts and data about our GHG emissions, targets and emission reduction activities. Raising supplier awareness is an important management method.

**Cost of management**

0

**Comment**

No additional direct cost

**Identifier**

Risk 5

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

Direct operations

**Risk type**

Physical risk

**Primary climate-related risk driver**

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

**Type of financial impact driver**

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

**Company- specific description**

Extreme weather events, such as tornadoes, hurricanes, typhoons and flooding, present a global business continuity risk to Tennant. With a global manufacturing model, we have production locations in Brazil, China, the Netherlands and the United States. Therefore, we face a possibility of extreme weather causing interruption at one or more manufacturing locations. Our direct operations are primarily located in low-risk areas from the perspective of floods, hurricanes and cyclones. Our Grand Prairie, Texas, and Minneapolis, Minnesota, operations are located in states with a higher than average likelihood of tornadoes.

**Time horizon**

Current

**Likelihood**

Unlikely

**Magnitude of impact**

High

**Potential financial impact**

1000000

**Explanation of financial impact**

Revenue impact could exceed \$1,000,000, depending on affected facility location. Total replacement of our largest manufacturing facility (in Minneapolis, MN) would cost over \$100 million.

**Management method**

We manage this risk by insuring all our facilities to cover losses from extreme weather events. This is integral to our annual risk assessment and the responsibility of our Environmental Health and Safety, Tax and Treasury, and Legal Departments. A register of properties is maintained by the Tax and Treasury Department, as a check point on current and appropriate types of insurance coverage. We also manage this risk by business continuity planning. In 2016, we identified the need for more robust business continuity plans. The plan for Minneapolis operations was put in place in 2017 and others are now in development. The improved business continuity plans will address the initial response phase more robustly. Initial response is known to be a key success determinant in mitigating risk. For example, an extreme weather event (caused or amplified by climate change) at one of our manufacturing facilities will invoke a prepared set of initial response actions by action owners. We also have multiple off-site data

centers to minimize the probability of business system unavailability.

**Cost of management**

200000

**Comment**

The \$200,000 is approximate direct cost - not including total cost of property insurance. Property insurance cost is more than \$600,000 for the most recent annual term.

---

**Identifier**

Risk 6

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

Supply chain

**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 revenues from lower sales/output

**Company- specific description**

Extreme weather events, such as tornadoes, hurricanes, typhoons and flooding, present a global business continuity risk to Tennant. With a hybrid global/local sourcing model, we have upstream supply chain partners located in many parts of the world. Therefore, we face a possibility of extreme weather causing interruption at one or more supplier locations.

**Time horizon**

Current

**Likelihood**

Unlikely

**Magnitude of impact**

High

**Potential financial impact**

1000000

**Explanation of financial impact**

Revenue impact could exceed \$1,000,000, depending on suppliers affected. Problems in our supply chain could make us unable to produce and ship finished goods. The potential financial implications range widely, depending on particular suppliers and the number of product lines affected.

**Management method**

Management methods include assessing our supply chain for risks and identifying critical suppliers. Critical suppliers include single sources and those producing items with high complexity and/or long lead times. We are planning to formalize business continuity discussions with these suppliers. Good business continuity planning addresses the initial response phase robustly. Initial response is known to be a key success determinant in mitigating risk. For example, an extreme weather event (caused or amplified by climate change) at one of our critical suppliers would invoke a prepared set of initial response actions by action owners at the supplier.

**Cost of management**

200000

**Comment**

Less than \$200,000 in direct cost

---

**C2.4**

---

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

Yes

---

## C2.4a

---

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

**Identifier**

Opp1

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

Direct operations

**Opportunity type**

Products and services

**Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

**Type of financial impact driver**

Increased revenue through demand for lower emissions products and services

**Company- specific description**

Extreme weather events, such as tornadoes, hurricanes, typhoons and flooding, may increase awareness of climate change as a serious issue. In turn, this awareness may drive increased demand for our products and solutions that offer customers carbon emissions avoidance. Customers are asking for much more detailed information in solicitations and Requests for Proposal as they drive toward their own carbon emission reduction goals and other environmental objectives. Providing environmental and performance advantaged products, with lowest total cost, is core to Tennant's value proposition. We have a broad line of eco-advantaged products, backed up by independent Life Cycle Assessment data. We see this as an opportunity for increased existing product demand, compared to our competitors.

**Time horizon**

Medium-term

**Likelihood**

More likely than not

**Magnitude of impact**

Medium-high

**Potential financial impact**

5000000

**Explanation of financial impact**

We expect to realize incremental sales greater than \$5,000,000. For example, we introduce another eco-advantaged product like ReadySpace which allows customers to reduce their carbon emissions, water use and waste. The product has a selling price of \$12,500 and 400 units are sold. This yields \$5,000,000 incremental revenue.

**Strategy to realize opportunity**

To realize this opportunity, Sustainable Enterprise remained a strategic priority in 2017. Products is one of four Sustainable Enterprise Focus Areas. We prioritize technology and product development, which includes carbon emissions avoidance and other environmental improvements in "Use of Sold Products" (our Scope 3). Examples of eco-advantaged products we developed and commercialized include ec-H2O technology, ReadySpace, and Orbio Technologies os3 and 5000-Sc. These products help our customers reduce their Scope 1+2 carbon emissions, water use and waste. In 2017, we added a dedicated Senior Product Stewardship Engineer who is embedded with the Research and Development group. This additional resource enhances our ability to pursue and advance technologies which lead to future eco-advantaged products.

**Cost to realize opportunity**

150000

**Comment**

Cost is approximate for additional resource. Total Research and Development investment in 2017 was more than \$32 M and this is applied across a broad array of initiatives. Project level investment is confidential information.

---

**Identifier**

Opp2



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

Direct operations

**Opportunity type**

Products and services

**Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

**Type of financial impact driver**

Increased revenue through demand for lower emissions products and services

**Company- specific description**

Tennant Company products are generally some of the highest performing, highest quality and lowest total cost to operate in the industry. Regulations to keep grounds and facilities clean, free of debris and safe for employees and occupants may drive increased demand for our products. Regulations for improved air quality (reduced particulates) may drive increased demand for our products. We cannot disclose proprietary technologies still in development, but an example might be advanced air filtration systems that increase worker safety by reducing exposure to hazardous particulates.

**Time horizon**

Short-term

**Likelihood**

Likely

**Magnitude of impact**

Medium

**Potential financial impact**

1000000

**Explanation of financial impact**

We expect to realize incremental sales greater than \$1,000,000. For example, we introduce an eco-advantaged, Tennant-branded solution which allows customers to reduce worker exposure to silica dust as well as reduce their carbon emissions. The product has a selling price of \$20,000 and 50 units are sold. This yields \$1,000,000 incremental revenue.

**Strategy to realize opportunity**

We actively engage to ensure we understand regulatory implications before they take effect. Products and solutions can be developed and tested, before the regulatory change takes effect. Our Product Regulatory Affairs personnel are involved in each product development project, as well as the governance of our product development roadmap. This provides long-term regulatory insight to the product planning process and roadmap. (New strategy to reflect silica) One example is anticipating the OSHA Respirable Crystalline Silica Standards now being applied in a number of US industries (General Industry and Maritime, Construction). We developed and validated products and solutions to help businesses limit worker exposure to crystalline silica - before the standards went into effect. We launched these products in 2017. We are working to educate customers on how they can reduce environmental impact and improve worker safety via direct sales force, marketing campaigns, blogs and our website.

**Cost to realize opportunity**

0

**Comment**

Total Research and Development investment in 2017 was more than \$32 M and this is applied across a broad array of initiatives. Project level investment is confidential information.

---

**Identifier**

Opp3

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

Direct operations

**Opportunity type**

Products and services

**Primary climate-related opportunity driver**

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

**Type of financial impact driver**

Increased revenue through demand for lower emissions products and services

**Company- specific description**

---

Tennant strives to create innovative, new products to meet customer needs. Our existing products are typically lowest total cost, with both environmental and performance advantages. We have a broad line of eco-advantaged products, backed up by independent Life Cycle Assessment data. We see this as a continuing opportunity for increased existing and future product demand, compared to our competitors. We have a number of technologies in development with potential to significantly increase revenue. We cannot disclose proprietary technologies still in development, but an example might be a large, rider scrubber-drier with an electric power system replacing internal combustion. This would reduce customer operating costs and carbon emissions.

**Time horizon**

Medium-term

**Likelihood**

Likely

**Magnitude of impact**

High

**Potential financial impact**

10000000

**Explanation of financial impact**

We expect to realize incremental sales greater than \$10,000,000. For example, we introduce an eco-advantaged, Tennant-branded large rider scrubber-drier which allows customers to reduce their carbon emissions. The product has a selling price of \$40,000 and 250 units are sold. This yields \$10,000,000 incremental revenue.

**Strategy to realize opportunity**

Our strategy to realize this opportunity is to actively and directly engage with our customers. We determine their evolving needs and expectations and also consider general societal trends. Having direct Sales and Service personnel in the field, in both developing and developed economies, helps this process immensely. Active and direct engagement enables Tennant Company to develop industry-leading products and services as well as continuously develop innovative sustainable solutions for customer facility maintenance needs. For example, our new products like the T500 and T350 scrubber-drier product families (both launched in 2017) will likely result in greater revenue and profit for the company. Both products provide customers opportunities to reduce environmental impacts.

**Cost to realize opportunity**

0

**Comment**

Total Research and Development investment in 2017 was more than \$32 M and this is applied across a broad array of initiatives. Project level investment is confidential information.

---

**Identifier**

Opp4

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

Direct operations

**Opportunity type**

Products and services

**Primary climate-related opportunity driver**

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

**Type of financial impact driver**

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

**Company- specific description**

Tennant strives to create innovative, new technologies to meet customer needs. Trend and voice of customer research indicate customers desire more efficient and sustainable products which use fewer chemicals. Developing environmental and performance advantaged technology, with lowest total cost, is core to Tennant's value proposition. We see this as an opportunity for increased future new technology product demand, compared to our competitors.

**Time horizon**

Long-term

**Likelihood**

Likely

**Magnitude of impact**

High

---

**Potential financial impact**

10000000

**Explanation of financial impact**

We expect to realize incremental sales greater than \$10,000,000.

**Strategy to realize opportunity**

Our strategy to realize this opportunity is to actively track 'mega-trends' including: population demographics, resource demands, environmental pressures, new technologies, etc. Observations and potential impacts are fed into our strategic planning process and Business Development Group to identify potentially disruptive and far-term business opportunities. Observations and potential impacts are also fed into our Advanced Products and Technology and New Product Steering Committees and their road-mapping processes. This enables Tennant Company to develop innovative sustainable solutions for future customer facility maintenance needs. For example, our development of water recycling and autonomous guided cleaning machine technologies will enable new products and services in the future.

**Cost to realize opportunity**

0

**Comment**

Total Research and Development investment in 2017 was more than \$32 M and this is applied across a broad array of initiatives. Project level investment is confidential information.

---

**Identifier**

Opp5

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

Direct operations

**Opportunity type**

Resource efficiency

**Primary climate-related opportunity driver**

Use of more efficient production and distribution processes

**Type of financial impact driver**

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

**Company- specific description**

Buildings and manufacturing processes

**Time horizon**

Current

**Likelihood**

Virtually certain

**Magnitude of impact**

Medium

**Potential financial impact**

100000

**Explanation of financial impact**

We expect to realize energy savings greater than \$100,000

**Strategy to realize opportunity**

As we upgrade manufacturing processes and facilities, we shift to more efficient equipment. This includes a broad array of building service type improvements as well as production equipment.

**Cost to realize opportunity**

0

**Comment**

In many cases there is no incremental cost to adopt more efficient process equipment. For example, a press brake used in metal parts fabrication is being replaced in one facility. The old press brake is powered by electricity and the hydraulic pump runs constantly. The new press brake has a hydraulic pump which runs on an as-needed basis. We have included all these types of opportunities in the detailed Emissions Reduction Activity reported in Section C4.3.

---

## C2.5

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

	Impact	Description
Products and services	Impacted for some suppliers, facilities, or product lines	One climate change opportunity we have seen in products and services is increased demand for technologies which reduce emissions. As an example, ec-H2O category of eco-advantaged products and services has exceeded \$1,200,000,000 revenue over a 10-year time period (2008-2017). Profit margins for this category have been greater than company average margins. The magnitude of cumulative revenue and profit impact over product lifetime is greater than total 2017 company revenue and profit.
Supply chain and/or value chain	Impacted	Customer use of our products is the largest element of our value chain carbon emissions (more than 70%). Customers have realized emission reduction by adapting eco-advantaged products like ec-H2O and ec-H2O NanoClean. We estimate our customers have avoided more than 75,000 mT CO2e emissions from all ec-H2O and ec-H2O NanoClean equipped scrubber-driers sold to date, in comparison to packaged chemicals. This estimate is based on independent LCAs performed by EcoForm and total unit sales. Avoided emissions are the result of significant reductions of input materials, elimination of packaging, and elimination of emissions from transportation. In 2017 alone, we estimate our customers avoided more than 13,000 mT CO2e emissions by using this group of products. This estimate is based on independent LCAs performed by EcoForm and the installed base operating in 2017.
Adaptation and mitigation activities	Impacted	We have increased our focus on energy reduction and renewable energy purchasing as mitigation toward some of the identified climate-related risks. Our management approach to this risk is monitoring utility usage by facility and focusing more effort on emissions reduction activities and energy supply projects. Impacts include reduced current operating costs and mitigating the longer term risk. For example, we achieved 2,034 mT CO2e absolute emission reduction in 2017, 6.3% less than 2016 emissions. As another example, our emissions reduction activity pipeline ("implementation commenced" + "to be implemented" phases) stands at 5,328 mT CO2e (as reported this year). At our Holland, Michigan, manufacturing facility, energy reduction projects have reduced electrical consumption by 42,3% from 2007 to 2017. Cumulative avoided electricity is 12,600 MWh, with cumulative cost savings greater than \$1,260,000.
Investment in R&D	Impacted	Another climate change related opportunity is accelerating product development cycle time and reducing time to market for eco-advantaged products. For example, ec-H2O NanoClean technology was accelerated to replace the original ec-H2O technology. NanoClean provides improved cleaning performance in a broader set of customer applications. The impact of faster time to market was sustained sales and profit for a technology that had been in market for a number of years.
Operations	Impacted	We have reduced operating costs for both manufacturing facilities and sales/service vehicle fleets by adapting energy- and fuel-saving technologies. Impacts include reduced current operating costs and mitigating the longer term risk. For example, we achieved 2,034 mT CO2e absolute emission reduction in 2017, 6.3% less than 2016 emissions. As another example, our emissions reduction activity pipeline ("implementation commenced" + "to be implemented" phases) stands at 5,328 mT CO2e (as reported this year). The North America Fleet Management team implemented a comprehensive program to reduce fuel usage. The team effort around specification and deployment of more efficient vehicles, plus increasing driver behavior awareness, reduced 2017 GHG emissions by more than 500 mT CO2e compared to 2016. The positive emissions impact also provided cost savings of more than \$135,000 in 2017.
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	As an example, one category of eco-advantaged products and services has exceeded \$1.2 billion in revenue over a 10-year time period (2008-2017). We consider the level of customer interest, given the competitive playing field, when investing in eco-advantaged technologies and products.
Operating costs	Impacted	Our work to reduce carbon emissions has resulted in significant electricity, natural gas and vehicle fuel cost savings. Impacts include reduced current operating costs and mitigating the longer term risk. For example, we achieved 2,034 mT CO2e absolute emission reduction in 2017, 6.3% less than 2016 emissions. As another example, our emissions reduction activity pipeline ("implementation commenced" + "to be implemented" phases) stands at 5,328 mT CO2e (as reported this year). The North America Fleet Management team implemented a comprehensive program to reduce fuel usage. The team effort around specification and deployment of more efficient vehicles, plus increasing driver behavior awareness, reduced 2017 GHG emissions by more than 500 mT CO2e compared to 2016. This positive emissions impact also provided cost savings of more than \$135,000 in 2017.
Capital expenditures / capital allocation	Impacted	We consider long-term energy and fuel cost savings in capital expense financial analysis. This is part of the financial model required for capital planning and approval. An example is approval of additional capital expense to realize total cost savings with battery test stands including discharge energy capture/recovery. The additional cost was \$30,000 per test stand, which provided a savings of more than \$6,000 per year in electricity cost.
Acquisitions and divestments	We have not identified any risks or opportunities	We have not undertaken any recent investments or divestments which relate directly to identified risks and opportunities.
Access to capital	We have not identified any risks or opportunities	To date, we have not seen any of the risks and opportunities identified in C2.3a and C2.4a impact our access to capital. We have strong cash flow and good access to capital. If we required greater access to capital, we believe investors would be more likely to commit given our CDP engagement and demonstrated improvement over time.
Assets	Not yet impacted	We have not seen any of the identified risks and opportunities impact our assets to date. Our main manufacturing and logistics facilities are insured and located in areas with relatively low flooding and hurricane risk. We do not see any change in this assessment for the next 5-10 years, but continue to monitor each location situation.
Liabilities	Not impacted	We have not identified risks and opportunities which may impact liabilities. We do not currently see any liability obligations in the future.
Other	Please select	

**C3. Business Strategy**

**C3.1**

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

Yes

**C3.1a**

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

Yes, quantitative

**C3.1c**

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

One of Tennant Company's Guiding Principles is "Stewardship," which is also one of our core values. We define Stewardship as leaving things in better condition than when we found them. Our Vision is: "lead our global industry in sustainable cleaning innovation that empowers our customers to create a cleaner, safer, and healthier world."

i. Climate-related issues continue as a growing global trend. We actively track 'mega-trends' like population demographics, environmental pressures including climate change, mechanization, new technologies, etc., as part of our strategic planning process. Observations and information are fed into the process to identify potentially disruptive risks and far-term business opportunities. Observations and potential impacts are also fed into our technology and product planning processes as well as the business development process.

ii. Our company business strategy is linked to emissions reduction targets. While energy reduction is good, we believe looking at carbon emissions in an enterprise-wide, strategic way is critically important for prioritizing investments. The Sustainable Enterprise group operates at the corporate level, reporting directly to the CEO. Carbon emissions reduction is the focus of this group. We encourage business units and functions to focus on cost and efficiency, which results in both energy use and carbon emissions reduction. Renewable energy purchasing and supply side agreements are done at the corporate level.

iii. The most substantial business decisions in reporting year 2017 driven by climate change involve energy purchasing. We've made consistent progress on our energy and fuel efficiency initiatives. As we pursue emission reduction targets, we are applying more effort toward energy purchasing. After signing two energy purchasing agreements in 2016, we added a third agreement in 2017. Our 2016 long-term subscriber commitment to Minnesota Community Solar Gardens enabled developer NextEra Energy Resources to begin adding capacity to the local grid in 2017. Our subscription entails capacity of 6.1 MW AC, which will yield more than 11,000 MWh in annual production. Renewable and cleaner energy contributes directly toward progress on our two Scope 1+2 emission reduction targets. Additional renewable energy alternatives will be investigated in 2018.

iv. Several aspects of climate change have influenced our strategies including: 1) the need to take a long-term, holistic look at our business and commit to both long-term success and short-term quarterly earnings to maximize stakeholder value; 2) the opportunity to reduce costs via energy/fuel efficiency improvement; and 3) business growth (top-line) opportunities from developing and commercializing sustainable cleaning innovation (green business).

v. The most important short-term (0-2 years) strategy component influenced by climate change is our energy and fuel use. Large cost savings are possible by identifying and implementing energy-saving projects. Over the years, we have become more systematic in managing these projects. The approach that has produced the greatest gains is having a true efficiency 'champion' in each facility, function and/or business unit. Developing and maintaining this formal network of energy 'champions' is an example of a short-term business strategy influenced by climate change. Our goal is to have a key, engaged person embedded in each significant GHG emitting entity. These entities include major facilities, i.e., manufacturing, and business units that have sales/service vehicle fleets. In 2017, the network was maintained for entities representing >85% of Scope 1+2 emissions. The result is faster potential project identification, leverage via sharing among locations, and faster project completion across the enterprise. Another result is consistent carbon emission reduction.

vi. The most important medium- to long-term (3 years and beyond) strategy component influenced by climate change is our product and technology strategy. "Use of Sold Products" is, by far, the largest part of our Scope 3 emissions. In 2017, we significantly increased our efforts by adding a dedicated resource - Senior Product Stewardship Engineer. The resource focuses on new technologies and new product development projects. Part of the increased effort in 2017 was development of long-term, science-based target for Scope 3, Category 11 - Use of Sold Products emissions. The targets were submitted in 2017 and approved by SBTi in early 2018.

vii. Developing and introducing eco-advantaged products like ec-H<sub>2</sub>O NanoClean®, Orbio 5000-Sc, and os3 continues to provide strategic business advantages over competitors. Since the 2008 introduction of ec-H<sub>2</sub>O™ technology, over 99,000 units have been sold. Revenue from ec-H<sub>2</sub>O over 2008-2017 is more than \$1.2 billion. We estimate the installed base of these products has enabled our customers to avoid more than 75,000 mT CO<sub>2</sub>e, when compared to packaged chemicals. This strong reduction outcome is more than two years of Tennant enterprise Scope 1+2 emissions. We continue to invest significantly in technologies and products which reduce customer environmental impacts - including carbon emissions. Customer preference for solutions which help reduce their environmental impact, including carbon emissions, continues to grow. This creates demand for products providing environmental impact reductions for the customer.

viii. The drive toward COP21 and The Paris Agreement in 2015 led us to commit to set science-based emission reduction targets under the SBTi led by CDP, UN Global Compact, World Resources Institute and World Wildlife Fund. These targets were finalized and submitted in 2017, then approved in early 2018. We also joined more than 700 of America's largest companies in signing The Climate Declaration, a call to action urging the public, policymakers and business leaders to seize the economic opportunity in tackling climate change. The Climate Declaration asserts that tackling climate change is America's greatest economic opportunity of the 21st century.

### C3.1d

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

Climate-related scenarios	Details
IEA Sustainable development scenario	<p>We use the IEA Sustainable Development Scenario CO2 price to assess transition risks from the growing trend toward carbon market mechanisms. There are externalized, societal costs from the use of fossil fuels. Explicit carbon pricing (carbon tax) along with cap and trade have been implemented in some markets around the world to address these externalities. We expect this trend to continue. We chose this scenario because the IEA has a global view which matches our global business footprint. The inputs used were our current carbon emissions profile and the assumptions are described below. The International Energy Agency (IEA) has estimated the externalized cost as \$63 mT CO2 and \$140 mT CO2 for 2025 and 2040, respectively, in advanced economies. <a href="http://www.iea.org/media/weo/website/2017/Chap1_WEO2017.pdf">http://www.iea.org/media/weo/website/2017/Chap1_WEO2017.pdf</a> REF: "World Energy Outlook 2017," International Energy Agency, pg. 48. This scenario has both direct and indirect (supply chain and client) implications. Direct impact ranges from \$1,900,000 to \$4,365,000 in annual operational cost. This impact estimate is based on 2017 total Scope 1+2 GHG emissions (market-based) of 30,466 mT CO2e and the IEA carbon price estimates. We expect to continue reducing emissions each year, so this annual range of cost is representative for the 2025 to 2040 timeframe. Indirect impact ranges from \$7,000,000 to \$15,560,000 in operational cost. This impact estimate is based on 2017 total Scope 3, Category 1 emissions of 111,145 mT CO2e and IEA carbon price estimates. We expect indirect emissions to increase each year as our business grows, likely faster than our supply chain can reduce emissions. Therefore, this annual range of cost may be understated for the 2025 to 2040 timeframe. We did not consider any changes from the reference scenario. The results are shared internally with the Senior Management Team. Increased leadership commitment to a long term view, setting aggressive targets to reduce carbon emissions, and leading the transition to a low carbon future is a good example of how scenario analysis results directly influenced our objectives and strategy. The results strengthened internal motivation for setting and achieving aggressive emission reduction targets. We were pleased to be among a group of companies which put the number of approved Science-Based Targets over 100 in early 2018. The results will be publicized as part of our CDP Climate Change Supply Chain Program response. We make the response public on our website each year. We intend to employ broader scenario analysis in the future, including specific emission reduction pro forma assumptions sets for both the direct and indirect portions.</p>

## C4. Targets and performance

### C4.1

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

Both absolute and intensity targets

### C4.1a

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

**Target reference number**

Abs 1

**Scope**

Scope 1 +2 (market-based)

**% emissions in Scope**

99

**% reduction from base year**

25

**Base year**

2016

**Start year**

2017

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

32480

**Target year**

2030

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

Yes, this target has been approved as science-based by the Science-Based Targets initiative

**% achieved (emissions)**

6.3

**Target status**

Underway

**Please explain**

The 25% absolute reduction target (Abs 1) was approved by Science Based Targets initiative (SBTi) in early 2018. The reduction achieved in 2017 compared to base year 2016 was 6.3% =  $((32,480 - 30,466) / 32,480)$ . As of 12/31/17, we achieved 25.3% of Abs 1 target in 7.1% of time toward goal. This target includes at least 99% of the company's total, global gross Scope 1+2 emissions in base year 2016. This target applies to all geographies and business units. What is not covered by this target are small facilities and facilities scheduled for demolition. We reassess our operational control boundary annually and did so in Q1 2018. We have a number of small facilities along with several unoccupied facilities scheduled for demolition. All emissions from these facilities are less than 1% of total reported emissions. When conducting the annual boundary assessment, if we identify relevant emissions not previously reported we restate prior year emissions to include them. IPC Group (acquired in April 2017) is not part of the 2016 base year emissions for this target. IPC Group emissions are not reported as part of 2017 emissions.

---

**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 (market-based)

**% emissions in Scope**

99

**% reduction from baseline year**

25

**Metric**

Metric tons CO2e per unit revenue

**Base year**

2012

---



**Start year**

2013

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

31515

**Target year**

2020

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

No, but we are reporting another target that is science-based

**% achieved (emissions)**

55.4

**Target status**

Underway

**Please explain**

The 25% revenue intensity reduction (Int 1) is our first target and was set in early 2014. As of 12/31/17, we achieved 55.4% of target in 62.5% of time toward goal. We expect to achieve Int 1 target by or before 2020 target year. As of 12/31/17, an absolute emissions reduction of 3.4% from base year 2012 has been achieved. NOTE: Several small oversights in previously reported emissions have been corrected. Base year 2012 emissions are restated to 31,515 mT CO2e (was 31,490 mT CO2e in our 2017 CDP response). This target includes at least 99% of the company's total, global gross Scope 1+2 emissions in base year 2012. This target applies to all geographies and business units. What is not covered by this target are small facilities and facilities scheduled for demolition. We reassess our operational control boundary annually and did so in Q1 2018. We have a number of small facilities along with several unoccupied facilities scheduled for demolition. All emissions from these facilities are less than 1% of total reported emissions. When conducting the annual boundary assessment, if we identify relevant emissions not previously reported we restate prior year emissions to include them. IPC Group (acquired in April 2017) is not part of the 2012 base year emissions for this target. IPC Group emissions are not reported as part of 2017 emissions.

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

10

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

---

**Target reference number**

Int 2

**Scope**

Scope 3: Use of sold products

**% emissions in Scope**

95

**% reduction from baseline year**

50

**Metric**

Other, please specify (mT CO2e per \$M of equipment revenue)

**Base year**

2016

**Start year**

2017

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

374655

**Target year**

2030

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

Yes, this target has been approved as science-based by the Science Based Targets initiative

**% achieved (emissions)**

7.8

**Target status**

Underway

**Please explain**

The 50% equipment revenue intensity reduction covers Scope 3, Category 11 - Use of Sold Products. The Int 2 target was approved by Science Based Targets initiative (SBTi) in early 2018. Start year (2017) emissions were verified by Trucost as 347,474 mT CO2e. The 27,181 mT CO2e absolute reduction achieved in 2017 calculates to 7.8% intensity reduction. As of 12/31/17, we achieved 15.6% of Int 2 target in 7.1% of time toward goal. This target includes at least 95% of the company's total, global gross Scope 3, Category 11 emissions in base year 2016. The target does not include intermediate products, floor coatings, reconditioned equipment, or third party products which are outside of our design control. IPC Group (acquired in April 2017) products are not part of the 2016 base year emissions for this target. IPC Group product emissions are not reported as part of 2017 emissions.

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

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

-24

---

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	21	
To be implemented*	13	5094
Implementation commenced*	3	234
Implemented*	19	1185
Not to be implemented	0	

---

C4.3b

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

**Activity type**

Other, please specify (Transportation: Fleet)

**Description of activity**

<Not Applicable>

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

475

**Scope**

Scope 1

**Voluntary/Mandatory**

Voluntary

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

129600

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

0

**Payback period**

<1 year

**Estimated lifetime of the initiative**

Ongoing

**Comment**

US Fleet. Service vehicle transition to more efficient models.

---

**Activity type**

Energy efficiency: Building services

**Description of activity**

Other, please specify (Lift truck fleet upgrade)

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

32

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

7776

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

0

**Payback period**

<1 year

**Estimated lifetime of the initiative**

11-15 years

**Comment**

Minneapolis, MN, US Manufacturing. Lift truck fleet transition which includes improved battery technology and opportunity charging.

---

**Activity type**

Other, please specify (Transportation: Fleet)

**Description of activity**

<Not Applicable>

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

31

**Scope**

Scope 1

**Voluntary/Mandatory**

Voluntary

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

8520

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

0

---

**Payback period**

<1 year

**Estimated lifetime of the initiative**

Ongoing

**Comment**

US Fleet. Driver awareness measures.

---

**Activity type**

Energy efficiency: Processes

**Description of activity**

Compressed air

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

31

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

6850

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

18819

**Payback period**

1-3 years

**Estimated lifetime of the initiative**

6-10 years

**Comment**

Uden, the Netherlands. New air compressor.

---

**Activity type**

Energy efficiency: Processes

**Description of activity**

Other, please specify (Energy capture - battery test stations)

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

26

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

6300

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

30000

**Payback period**

4 - 10 years

**Estimated lifetime of the initiative**

16-20 years

**Comment**

Minneapolis, MN, US. Research and Development. Avoided energy use with new in-house test capacity.

---

**Activity type**

---

Energy efficiency: Building services

**Description of activity**

Motors and drives

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

11

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

2610

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

6000

**Payback period**

1-3 years

**Estimated lifetime of the initiative**

6-10 years

**Comment**

Minneapolis, MN, US. Manufacturing. Upgrade on Makeup Air Unit.

---

**Activity type**

Energy efficiency: Processes

**Description of activity**

Machine replacement

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

8

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

1827

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

0

**Payback period**

<1 year

**Estimated lifetime of the initiative**

16-20 years

**Comment**

Uden, the Netherlands. Manufacturing. Replacement laser.

---

**Activity type**

Energy efficiency: Building services

**Description of activity**

HVAC

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

7

**Scope**

Scope 2 (market-based)

---

**Voluntary/Mandatory**

Voluntary

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

1692

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

8500

**Payback period**

4 - 10 years

**Estimated lifetime of the initiative**

11-15 years

**Comment**

Minneapolis, MN, US. Manufacturing. Replacement of many small, inefficient fans with HVLS fans.

---

**Activity type**

Energy efficiency: Building services

**Description of activity**

Other, please specify (Fast open/close garage door)

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

6

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

553

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

5430

**Payback period**

4 - 10 years

**Estimated lifetime of the initiative**

6-10 years

**Comment**

Minneapolis, MN, US. Research and Development facility improvement.

---

**Activity type**

Energy efficiency: Building services

**Description of activity**

Lighting

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

6

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

1336

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

3224

**Payback period**

---

1-3 years

**Estimated lifetime of the initiative**

6-10 years

**Comment**

Minneapolis, MN US. HQ. Upgrade kitchen/cafeteria lighting to LED.

---

**Activity type**

Energy efficiency: Building services

**Description of activity**

Other, please specify (Reach truck fleet upgrade)

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

5

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

750

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

0

**Payback period**

<1 year

**Estimated lifetime of the initiative**

11-15 years

**Comment**

Louisville, KY, US. Distribution Center. Reach truck fleet transition which includes improved battery technology and opportunity charging.

---

**Activity type**

Energy efficiency: Building services

**Description of activity**

Lighting

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

4

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

14339

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

34912

**Payback period**

1-3 years

**Estimated lifetime of the initiative**

6-10 years

**Comment**

Limeira, Brazil. Manufacturing. Upgrade facility lighting to LED.

---

**Activity type**

---

Energy efficiency: Building services

**Description of activity**

Other, please specify (Reach truck fleet upgrade)

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

2

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

548

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

0

**Payback period**

<1 year

**Estimated lifetime of the initiative**

11-15 years

**Comment**

Uden, the Netherlands. Distribution Center. Reach truck fleet transition which includes improved battery technology and opportunity charging.

---

**Activity type**

Energy efficiency: Processes

**Description of activity**

Machine replacement

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

2

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

457

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

0

**Payback period**

<1 year

**Estimated lifetime of the initiative**

11-15 years

**Comment**

Uden, the Netherlands. Manufacturing. Robotic welding fixture.

---

**Activity type**

Energy efficiency: Building services

**Description of activity**

Building controls

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

1

**Scope**

---



Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

520

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

0

**Payback period**

<1 year

**Estimated lifetime of the initiative**

>30 years

**Comment**

Northampton, UK. Lighting switch-off and other timers.

---

**Activity type**

Energy efficiency: Building services

**Description of activity**

Lighting

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

1

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

125

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

215

**Payback period**

1-3 years

**Estimated lifetime of the initiative**

6-10 years

**Comment**

Holland, MI, US. Initial phase of workbench replacement with LED lighting upgrade.

---

**Activity type**

Energy efficiency: Building services

**Description of activity**

Lighting

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

1

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

814

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

1276

---

**Payback period**

1-3 years

**Estimated lifetime of the initiative**

6-10 years

**Comment**

Sao Paulo, Brazil. Continuation of LED lighting upgrade project.

---

**Activity type**

Low-carbon energy purchase

**Description of activity**

Other, please specify (Wind energy purchase)

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

531

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

0

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

595

**Payback period**

<1 year

**Estimated lifetime of the initiative**

1-2 years

**Comment**

Grand Prairie, TX and Louisville, KY US electricity use. Purchase of wind energy RECs.

---

**Activity type**

Energy efficiency: Building services

**Description of activity**

Lighting

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

5

**Scope**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

1254

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

10000

**Payback period**

4 - 10 years

**Estimated lifetime of the initiative**

6-10 years

**Comment**

Minneapolis, MN US. HQ. Continuation of project upgrading building perimeter lighting to LED.

---

### C4.3c

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

Method	Comment
Compliance with regulatory requirements/standards	Regulatory requirements and standards related to energy and fuel efficiency continue to help drive emissions reduction. The Renewable Energy Standard (RES) in Minnesota is a good example. The RES has significantly increased the percentage of renewable energy sources on the grid supplying our largest electrical demands (Minneapolis campus). We also see electricity demand reduction benefit from standards driven upgrades to devices we regularly replace. These devices include computers, phones, etc.
Employee engagement	Employees are encouraged to submit improvement ideas, including energy reduction and efficiency, under many different Continuous Improvement (CI) programs. There are many different programs globally, tailored to function and/or location activities. One example program is "What's on your mind" sessions held in Minneapolis.
Financial optimization calculations	Estimating energy/fuel reduction for building upgrades, new equipment and process investments was added to the Annual Operating Plan-Capital Planning template in 2014. Additional detail is required in Capital Expenditure Requests (CERs), via a template update made in 2015. The CER is used to analyze and justify capital investments. Each CER is routed through required approvers before a project can start.
Internal incentives/recognition programs	Employees can be nominated by their peers and leadership for APPLAUSE and Leading Edge Awards. These programs can provide both recognition and monetary rewards for work toward energy/fuel efficiency and emissions reductions.
Internal finance mechanisms	The Annual Operating Plan process was revised so Capital Equipment projects which yield GHG emission reductions are distinctly identified. Beginning in Q4 2014, all of these Capital Equipment projects are viewed as a company-wide portfolio to ensure we are making the best investments.
Internal price on carbon	We use an internal price on carbon (shadow price) to assess future enterprise risk from market mechanisms addressing external costs of fossil fuels. These market mechanisms continue expanding globally and we expect this expansion to continue over the long term.
Other	We employ independent energy assessment organizations to identify energy reduction and efficiency opportunities. We also regularly engage our business partners, including utilities and fleet management companies, to identify new opportunities and best practices around energy/fuel efficiency improvements and emissions reductions.

### C4.5

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

Yes

### C4.5a

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

**Level of aggregation**

Group of products

**Description of product/Group of products**

Detergent-free products including: Orbio os3 and 5000-Sc; ec-H2O and ec-H2O NanoClean scrubber-driers.

**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 (Product Life Cycle Assessments (LCAs))

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

19

**Comment**

1) We estimate our customers have avoided more than 75,000 mT CO2e emissions from all ec-H2O and ec-H2O NanoClean equipped scrubber-driers sold to date, in comparison to packaged chemicals. This estimate is based on independent LCAs performed by EcoForm and total unit sales. Avoided emissions are the result of significant reductions of input materials, elimination of packaging and elimination of emissions from transportation. 2) In 2017 alone, we estimate our customers avoided more than 13,000 mT CO2e emissions by using this group of products. This estimate is based on independent LCAs performed by EcoForm and the installed base operating in 2017.

---

**Level of aggregation**

Group of products

**Description of product/Group of products**

Reconditioned equipment (RECON)

**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 (LCA and analogy to lift truck LCA)

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

3

**Comment**

Our reconditioned (RECON) equipment business avoids both upstream supply chain and downstream end-of-life emissions. Lift trucks are similar to our equipment in terms of components, power sources and types of use. We have researched LCA performed for reconditioned equipment in the lift truck industry. We know the avoided emissions are significant. We began a process LCA in Q4 2017 on Certified Pre-Owned and Used RECON product variants. This LCA will be complete in 2018 and provide a basis for more accurate estimation of avoided emissions.

---

## C5. Emissions methodology

---

### C5.1

---

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

**Scope 1**

**Base year start**

January 1 2012

**Base year end**

December 31 2012

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

21062.5

**Comment**

**Scope 2 (location-based)**

**Base year start**

January 1 2012

**Base year end**

December 31 2012

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

14034.5

**Comment**

**Scope 2 (market-based)**

**Base year start**

January 1 2012

**Base year end**

December 31 2012

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

10452.9

**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 Climate Registry: General Reporting Protocol

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)**

22421

**End-year of reporting period**

<Not Applicable>

**Comment**

2017 Reporting Year

**Row 2**

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

23059

**End-year of reporting period**

2016

**Comment**

2016 is base year for Abs 1 and Int 2, the Science-Based Targets. 2016 emissions are restated to address several minor data oversights.

**Row 3**

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

21063

**End-year of reporting period**

2012

**Comment**

2012 is base year for the Int 1 target. 2012 emissions have been restated to address several minor data oversights.

**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**

11654

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

8025

**End-year of reporting period**

<Not Applicable>

**Comment**

2017 Reporting Year

**Row 2**

**Scope 2, location-based**

13204

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

9421

**End-year of reporting period**

2016

**Comment**

2016 is base year for Abs 1 and Int 2, the Science-Based Targets. 2016 emissions have been restated to address several minor data oversights.

**Row 3**

**Scope 2, location-based**

14034.5

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

10452.9

**End-year of reporting period**

2012

**Comment**

2012 is base year for the Int 1 target. 2012 emissions have been restated to address several minor data oversights.

**C6.4**

---

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

Yes

**C6.4a**

---

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

**Source**

Small facilities and facilities scheduled for demolition

**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**

We reassess our operational control boundary annually and did so in Q1 2018. We have a number of small facilities along with several unoccupied facilities scheduled for demolition. All emissions from these facilities are less than 1% of total reported emissions. When conducting the annual boundary assessment, if we identify relevant emissions not previously reported we restate prior year emissions to include them.

---

**Source**

IPC Group - This is an acquisition which closed on April 6, 2017. As such, IPC Group (IPC) was not a full year part of Tennant Company in 2017.

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

Emissions are relevant but not yet calculated

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

Emissions are relevant but not yet calculated

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

Emissions are relevant but not yet calculated

**Explain why the source is excluded**

IPC Group (IPC) was acquired in 2017 and the deal closed on April 6, 2017. This is a recent acquisition which took place within 17 months of our 2018 response submission date to CDP. IPC has a number of country based sales offices, five manufacturing sites in Italy, and a number of fleet vehicles. We have not yet calculated emissions for IPC. We very roughly estimate IPC's annual Scope 1+2 emissions at approximately 15% of Tennant Company total Scope 1+2 emissions. This estimate is based on: 1) nature of IPC manufacturing operations – primarily integration and assembly; 2) moderate climate in Padova, Italy area where manufacturing sites are located; and 3) number of sales/service vehicles in operation. The integration plan for IPC initially focuses on finance systems, information technology, and human resources; country-by-country sales and service integration where both Tennant Company and IPC have direct presence; and synergy opportunities related to sales channels, cross-selling and cost including supply chain. Given the integration plan nature, we made a conscious decision to exclude IPC from 2017 voluntary reporting. Therefore, emissions from IPC are not included in Tennant Company 2017 emissions. IPC was not a full year part of Tennant Company. IPC is not included in the base year emissions for any of our three reduction targets: Abs 1, Int 1 and Int 2. We plan to include IPC emissions with 2018 fiscal year voluntary reporting, which is the first full year. We also plan to update our emission reduction targets to include IPC in 2019 or 2020. A decision on target update timing will be made in first half of 2019. We intend to submit the new targets to SBTi for approval.

---

**C6.5**

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



## Purchased goods and services

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

111145

### Emissions calculation methodology

Trucost S and P Global (Trucost) used its EEI-O model to calculate the supply chain GHG emissions through all tiers up to and including raw material extraction, based on Tennant's spend data for FY2017 and the previous analyses. Trucost scaled emissions from FY2016 to the 2017 spend amount, assuming the same proportional spend and exclusions.

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

7

### Explanation

The Trucost EEI-O life cycle based model uses sector data along with companies' public disclosure of environmental performance indicators. An estimated 7% of total Category 1 emissions are from Tennant supplier data which is built into the Trucost model.

## Capital goods

### 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

Working with Trucost, we calculated emissions from the Capital goods category for 2014. We determined this category is not relevant (less than 1% of total GHG emissions), based on quantitative analysis of 2014 data.

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

### 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

Working with Trucost, we calculated emissions from the Fuel-and-energy-related activities category for 2014. We determined this category is not relevant (less than 1% of total GHG emissions), based on quantitative analysis of 2014 data.

## Upstream transportation and distribution

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

20365

### Emissions calculation methodology

Trucost used its EEI-O model to calculate GHG emissions for each component of transportation and distribution, based on Tennant's spend by transportation mode. In an improvement to previous analysis, outbound but paid for shipments were incorporated into upstream emissions rather than downstream as they have been previously allocated.

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

0

### Explanation

## Waste generated in operations

### 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

Working with Trucost, we calculated emissions from the Waste generated in operations category for 2014. We determined this category is not relevant (less than 1% of total GHG emissions), based on quantitative analysis of 2014 data.

## Business travel

### 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

Working with Trucost, we calculated emissions from the Business travel category for 2014. We determined this category is not relevant (less than 1% of total GHG emissions), based on quantitative analysis of 2014 data.

## Employee commuting

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

8358

### Emissions calculation methodology

Trucost estimated employee commuting emissions using Tennant's global employee head count and country averages for commuting time, transportation mode and distance.

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

0

### Explanation

## 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

Working with Trucost, we determined the Upstream leased assets category is not applicable to Tennant Company's business activities.

## Downstream transportation and distribution

### Evaluation status

Not relevant, calculated

### Metric tonnes CO2e

116

### Emissions calculation methodology

Using proportional spend to distribution centers, Trucost estimated further onward travel of sold goods based on product mass and average freight distribution distances. Trucost used Tennant product data to estimate total mass of products, and calculated tkm traveled by goods before applying Defra freighted goods emission factors. Only US distributor data was known, therefore calculated emissions per million \$ spend was applied to spend for distribution in other regions, assuming a consistent proportion of goods are sent directly for use versus to distributors for onward sale. Limitations in data are significant, but sensitivity analysis with conservative estimates resulted in immaterial impacts and therefore this is deemed acceptable for analysis.

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

0

### Explanation

## Processing of sold products

### 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

Tennant and Trucost determined the Processing of sold products category to be not relevant, based on the analysis of 2014 data.

## Use of sold products

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

367566

### Emissions calculation methodology

We developed a product portfolio emissions calculator tool, which estimates product life emissions based on a set of assumptions for each product category. The assumptions include: product life (in years); number of uses per year; and energy per use (kWh or fuel volume). These assumptions are combined with appropriate emission factors. For cord and battery products, we use the electric grid emission factor for sold-to country. For internal combustion products, we use standard emission factors for each fuel type (gasoline, diesel, or LPG). We also include an indirect emission factor which represents indirect emissions required for waste-water treatment, water use, and maintenance activities. The indirect emissions factor is based on Life Cycle Assessment data for a representative product (T300). The indirect emissions factor is adjusted up/down based on relative model complexity/simplicity. 2016 and 2017 calculated emissions for Use of Sold Products have been verified by Trucost.

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

100

### Explanation

In developing the product portfolio emissions calculator tool, we used sales/service machine life data along with hour-meter and IRIS usage frequency data. This data comes directly (or indirectly) from the value chain partner - customers. Scope 3, Category 11 'use of sold products' does not include intermediate products, floor coatings, or reconditioned equipment.

## End of life treatment of sold products

### Evaluation status

Not relevant, explanation provided

### Metric tonnes CO<sub>2</sub>e

### Emissions calculation methodology

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

### Explanation

Working with Trucost, we calculated emissions from the End of life treatment of sold products category for 2014. We determined this category is not relevant (less than 1% of total GHG emissions), based on quantitative analysis of 2014 data.

## Downstream leased assets

### Evaluation status

Not relevant, explanation provided

### Metric tonnes CO<sub>2</sub>e

### Emissions calculation methodology

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

### Explanation

Tennant and Trucost determined the Downstream leased assets category to be not relevant, based on the analysis of 2014 data.

## Franchises

### Evaluation status

Not relevant, explanation provided

### Metric tonnes CO<sub>2</sub>e

### Emissions calculation methodology

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

### Explanation

Tennant and Trucost determined the Franchises category to be not relevant, based on the analysis of 2014 data.

## Investments

### Evaluation status

Not relevant, explanation provided

### Metric tonnes CO<sub>2</sub>e

### Emissions calculation methodology

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

### Explanation

Tennant and Trucost determined the Investments category to be not relevant, based on the analysis of 2014 data.

## Other (upstream)

### Evaluation status

Not relevant, explanation provided

### Metric tonnes CO<sub>2</sub>e

### Emissions calculation methodology

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

### Explanation

Beyond Purchased goods and services, Upstream transportation, and Employee commuting we have not identified any other upstream activities that are relevant.

## Other (downstream)

### 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

Beyond Use of sold products we have not identified any other downstream activities that are relevant.

## 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

36.7

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

30466

#### Metric denominator

unit total revenue

#### Metric denominator: Unit total

828622

#### Scope 2 figure used

Market-based

#### % change from previous year

6.3

#### Direction of change

Decreased

#### Reason for change

Emissions reduction activities, including efficiency projects and energy purchasing, contributed about two-thirds of the year over year decrease. The trend toward cleaner electrical grids contributed about one-third of the decrease. Total reductions achieved were more than enough to offset the 513 mT CO2e increase from 2016 acquisitions: 1) 2017 full year of Florock (+294 mT CO2e); and 2) 2017 full year of Dofesa (+219 mT CO2e).

---

## 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	22342	IPCC Fifth Assessment Report (AR5 – 100 year)
CH4	12	IPCC Fifth Assessment Report (AR5 – 100 year)
N2O	67	IPCC Fifth Assessment Report (AR5 – 100 year)

## C7.2

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

Country/Region	Scope 1 emissions (metric tons CO2e)
Australia	453
Belgium	99
Brazil	464
Canada	913
China	0
France	899
Germany	615
Japan	171
Mexico	295
Netherlands	1177
Portugal	152
Spain	528
United Kingdom of Great Britain and Northern Ireland	890
United States of America	15765

## C7.3

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

By business division

### C7.3a

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

Business division	Scope 1 emissions (metric ton CO2e)
Americas - North, Central, and South America	17437
EMEA - Europe, Middle East, and Africa	4360
APAC- Asia Pacific	624

## 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	182	182	220	0
Belgium	19	19	95	0
Brazil	16	16	228	0
Canada	3	3	83	0
China	296	296	387	0
France	7	7	112	0
Germany	18	18	36	0
Japan	37	37	75	0
Mexico	30	30	54	0
Netherlands	901	117	2217	2000
Portugal	0	0	0	0
Spain	23	23	78	0
United Kingdom of Great Britain and Northern Ireland	36	36	82	0
United States of America	10086	7241	17864	850

## C7.6

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

By business division

### C7.6a

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

Business division	Scope 2, location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Americas - North, Central, and South America	10135	7290
EMEA - Europe, Middle East, and Africa	1004	220
APAC- Asia Pacific	515	515

## 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	513	Decreased	1.58	Purchased 850 ERCOT wind RECs in 2017, while continuing our prior year level of renewable energy purchases (2,000 MWh). A portion of these ERCOT RECs were applied to electrical consumption at our facility in Grand Prairie, Texas, which is within the ERCT eGRID area. The remainder of the RECs were applied to our facility in Louisville, Kentucky, in SRTV eGRID area and nearest location to ERCT. The TRE and SERC residual emissions factors were applied for Grand Prairie and Louisville electrical use above that covered by these RECs. 2016 Scope 1+2 emissions were 32,480 mT (as restated to address several small oversights). $(513 / 32,480) * 100 = 1.58\%$
Other emissions reduction activities	654	Decreased	2.01	Efficiency projects for global sales and service vehicle fleets and at global facilities. 2016 Scope 1+2 emissions were 32,480 mT (as restated to address several small oversights). $(654 / 32,480) * 100 = 2.01\%$
Divestment	54	Decreased	0.17	As of January 31, 2016, we closed on the sale of our Green Machines outdoor city cleaning line to Green Machines International GmbH and affiliates, subsidiaries of M+F Management and Financing GmbH. Therefore, as of February 2016, Green Machines was no longer a company-owned brand. 2016 total emissions from the Green Machines entity were 54 mT CO2e. 2016 Scope 1+2 emissions were 32,480 mT (as restated to address several small oversights). $(54 / 32,480) * 100 = 0.17\%$
Acquisitions	513	Increased	1.58	Florock (Chicago, Illinois) was acquired on July 28, 2016. Dofesa (Aguascalientes, Mexico) was acquired on September 1, 2016, and became our Mexico Sales and Service Organization (SSO). These acquisitions entailed 225 mT (restated from 219 mT) and 106 mT CO2e emissions in 2016, respectively. 2017 full year emissions from Florock and Mexico SSO were 519 mT and 325 mT, respectively. The 2017 increase due to a full year of these acquisitions was 513 mT CO2e $(519+325-225-106)$ . 2016 Scope 1+2 emissions were 32,480 mT (as restated to address several small oversights). $(513 / 32,480) * 100 = 1.58\%$
Mergers		<Not Applicable>		
Change in output	254	Decreased	0.78	Open positions in the US Service workforce resulted in less motor fuel consumption. 2016 Scope 1+2 emissions were 32,480 mT (as restated to address several small oversights). $(254 / 32,480) * 100 = 0.78\%$
Change in methodology		<Not Applicable>		
Change in boundary	7	Increased	0.02	Opened an additional reconditioned equipment facility in EMEA. 2016 Scope 1+2 emissions were 32,480 mT (as restated to address several small oversights). $(7 / 32,480) * 100 = 0.02\%$
Change in physical operating conditions		<Not Applicable>		
Unidentified		<Not Applicable>		
Other	1079	Decreased	3.32	Grid emission factor improvement in eGRID regions RFCM and RFCW, along with the Xcel Energy Northern States Power region total 760 mT CO2e of this overall 1,079 mT decrease. The remaining 319 mT decrease comes from a number of sources including operating efficiencies and grid emissions factors for facilities not included in our top 90% of emissions by entity (SSO fleet or specific facility). 2016 Scope 1+2 emissions were 32,480 mT (as restated to address several small oversights). $(1,079 / 32,480) * 100 = 3.32\%$

**C7.9b**

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

Market-based

**C8. Energy**

**C8.1**



---

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

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

**C8.2**

---

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

	Indicate whether your organization undertakes this energy-related activity
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	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)	HHV (higher heating value)	37	96258	96295
Consumption of purchased or acquired electricity	<Not Applicable>	2850	18680	21530
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>	2887	114938	117825

**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)**

Natural Gas

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

37624

**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**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

14933

**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)**

Motor Gasoline

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

43720

**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)**

Bioethanol

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

37

**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)**

Liquefied Petroleum Gas (LPG)

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

230

**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 Liquid

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

111

**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.**

**Bioethanol**

**Emission factor**

6.2045

**Unit**

kg CO2e per gallon

**Emission factor source**

Climate Registry 2017 Default Emission Factors, March 15, 2017 Climate Registry General Reporting Protocol 2.1, January 2016

**Comment**

**Diesel**

**Emission factor**

10.21

**Unit**

kg CO2e per gallon

**Emission factor source**

Climate Registry 2017 Default Emission Factors, March 15, 2017 Climate Registry General Reporting Protocol 2.1, January 2016

**Comment**

**Liquefied Petroleum Gas (LPG)**

**Emission factor**

5.68

**Unit**

kg CO2e per gallon

**Emission factor source**

Climate Registry 2017 Default Emission Factors, March 15, 2017 Climate Registry General Reporting Protocol 2.1, January 2016

**Comment**

**Motor Gasoline**

**Emission factor**

8.78

**Unit**

kg CO2e per gallon

**Emission factor source**

Climate Registry 2017 Default Emission Factors, March 15, 2017 Climate Registry General Reporting Protocol 2.1, January 2016

**Comment**

## Natural Gas

### Emission factor

53.1

### Unit

kg CO2e per million Btu

### Emission factor source

Climate Registry 2017 Default Emission Factors, March 15, 2017 Climate Registry General Reporting Protocol 2.1 January 2016

### Comment

## Propane Liquid

### Emission factor

5.7

### Unit

kg CO2e per gallon

### Emission factor source

Climate Registry 2017 Default Emission Factors, March 15, 2017 Climate Registry General Reporting Protocol 2.1 January 2016

### 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

Energy attribute certificates, Guarantees of Origin

### Low-carbon technology type

Wind

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

2000

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

0

### Comment

Our operations in Uden, Netherlands purchased GoO's to cover the majority of electricity consumption during the reporting year. For the consumption that was not covered, we applied the appropriate residual mix emission factor.

---

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

Energy attribute certificates, Renewable Energy Certificates (RECs)

### Low-carbon technology type

Wind

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

850

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

0

### Comment

We purchased ERCOT REC's to cover most of the electricity consumption (77 MWh) at our Grand Prairie, Texas facility and a portion of electricity consumption at our Louisville, Kentucky facility (773 MWh). For consumption at each location not covered by the RECs, we applied the appropriate residual mix emission factors.

---

## C9. Additional metrics

---

### C9.1

---

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

## C10. Verification

---

### C10.1

---

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

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

### C10.1a

---

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

**Scope**

Scope 1

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Moderate assurance

**Attach the statement**

20180803\_Assurance statement Tennant Company - FINAL.pdf

**Page/ section reference**

Page 1 - GHG Scope 1 Verified by Trucost

**Relevant standard**

A1000AS

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

100

---

**Scope**

Scope 2 location-based

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Moderate assurance

**Attach the statement**

20180803\_Assurance statement Tennant Company - FINAL.pdf

**Page/ section reference**

Page 1 - GHG Scope 2 Location Based Verified by Trucost

**Relevant standard**

A1000AS

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

100

---

**Scope**

Scope 2 market-based

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Moderate assurance

**Attach the statement**

20180803\_Assurance statement Tennant Company - FINAL.pdf

**Page/ section reference**

Page 1 - GHG Scope 2 Market Based Verified by Trucost

**Relevant standard**

A1000AS

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

100

---

## C10.1b

---

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

**Scope**

Scope 3- at least one applicable category

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Attach the statement**

20180803\_Assurance statement Tennant Company - FINAL.pdf

**Page/section reference**

Page 1 - GHG Scope 3 Use of Sold Products (2017) Verified by Trucost

**Relevant standard**

AA1000AS

---

## C10.2

---

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

Yes

## C10.2a

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

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C6. Emissions data	Year on year change in emissions (Scope 3) <i>Scope 3, Category 11 - Use of Sold Products emissions were verified for both 2016 and 2017 in August 2018 by Trucost.</i>	AA1000AS Type 2, moderate level assurance	Scope 3, Category 11 - Use of Sold Products is the largest portion of our value chain carbon footprint. Prior year emissions were verified by Trucost as 386,804 mT CO2e. Reporting year (2017) emissions were also verified by Trucost as 367,566 mT CO2e. The year-on-year change in emissions is calculated using these verified 2017 and 2016 figures (367,566 - 386,804 = -19,238). The resulting -19,238 mT CO2e year-on-year absolute change results in a 5% year-on-year intensity reduction. 20180803_Assurance statement Tennant Company - FINAL.pdf

## C11. Carbon pricing

### C11.1

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

Yes

### C11.1a

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

Other carbon tax, please specify (UK Climate Change Levy (CCL))

### C11.1c

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

**Other carbon tax, please specify**

**Period start date**

January 1 2017

**Period end date**

December 31 2017

**% of emissions covered by tax**

0.12

**Total cost of tax paid**

573

**Comment**

The UK Climate Change Levy (CCL) is one example of a carbon tax applied to our business. The CCL is applied to electricity used at our Northampton, UK, location. In 2017, the CCL additional cost for electricity was 463 GBP / (0.808 \$ / GBP) = \$573.



## C11.1d

---

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

We comply by paying carbon taxes as a cost of business. Carbon taxes currently apply to some portions of our global business. We do not separately track carbon taxes paid in each country where we operate. These taxes are not always easy to identify separately and some are passed on to end users indirectly.

One example of a carbon tax directly applied to our business is The UK Climate Change Levy (CCL). The CCL is applied to electricity used at our Northampton, UK, location. In 2017, the CCL additional cost for electricity was 463 GBP / (0.808 \$ / GBP) = \$573. This cost was quantified by examining invoice detail.

Emissions Trading Schemes (ETS) do not apply to portions of our global business today, but could potentially apply in the next 2-5 years. We monitor ETS and other regulatory developments in the areas we operate, both to ensure compliance and minimize risk.

Our highest priority strategies are efficiency improvement and low-carbon energy purchasing, which result in reduced carbon emissions.

## C11.2

---

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

No

## C11.3

---

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

Yes

## C11.3a

---

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

**Objective for implementing an internal carbon price**

- Change internal behavior
- Drive energy efficiency
- Drive low-carbon investment
- Other, please specify (Quantify risk)

**GHG Scope**

- Scope 1
- Scope 2
- Scope 3

**Application**

We use an internal price of carbon to both quantify risk and understand full potential impacts of change in our energy usage. The risk application is explained in the "Impact and implication" section that follows below. We consider the carbon price in long term capital investments, facility improvements, etc. For example, we recently invested in cycle testing equipment for the batteries used in our products. The equipment we selected recovers the energy discharged from batteries under test and returns it to the grid. Without the energy capture option, each discharge cycle would result in wasted energy. Energy cost savings over equipment life was factored into the capital expenditure analysis. Scenarios with future electricity rates including carbon taxes were part of the discussion prior to making the decision to include discharge energy capture - which was an additional cost.

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

125

**Variance of price(s) used**

A full value chain assessment has been completed for each of the past 4 years, 2014-2017. This year "Tennant Value Chain Greenhouse Gas Footprint - Fiscal Year 2017" priced emissions at \$125/tCO<sub>2</sub>e, with inflation taken into account ([www3.epa.gov/climatechange/EPAactivities/economics/scc.html](http://www3.epa.gov/climatechange/EPAactivities/economics/scc.html)). Other internal assessments use \$140.17/metric ton. This price uses \$125/mT and also includes the average global producer subsidy for fossil fuel of \$15.17 – as calculated from 2014 global emissions (32.3 B tons CO<sub>2</sub>) and producer subsidy data published by IEA.

**Type of internal carbon price**

Shadow price

**Impact & implication**

We expect carbon taxes to be used more broadly and subsidies for fossil fuels to be eliminated over time. We use an internal carbon price to assess short- and long-term economic risks from climate change driven policy. In 2016, we assessed the potential impact of eliminating pre-tax fossil fuel subsidies, combined with new carbon taxes to address externalities. The analysis quantified potential FY2014 impact as more than \$100 M. The assessment was at the enterprise level and covered our full value chain. We broke the potential impact down to Business Units and Functional Groups. The information was communicated to the Global Leadership Team to increase awareness and provide motivation to pursue energy/fuel use reductions and renewable energy. The Global Leadership Team includes about 70 leaders at the Director level and above. For FY2017, Trucost estimated social costs of our Scope 1, 2, and 3 GHG emissions at more than \$65 million, which is greater than 6% of our 2017 revenue. Potential impact in both internal assessments and Trucost RY2017 cases exceeds our financial materiality definition of greater than 5% of pre-tax earnings. In addition to quantifying/managing risks to Tennant Company, we consider how new technologies and products can reduce our customer's emissions. We use Life-Cycle Analysis to quantify environmental impacts - including carbon emissions. Potential customer cost of future carbon taxes can be quantified and included as part of total cost and value proposition discussions.

---

**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) Provide details of your climate-related supplier engagement strategy.**

**Type of engagement**

Engagement & incentivization (changing supplier behavior)

**Details of engagement**

Run an engagement campaign to educate suppliers about climate change  
Other, please specify (Collaborative Suggestion Program)

**% of suppliers by number**

11

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

79

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

21.9

**Rationale for the coverage of your engagement**

The 2017 Supplier Summit targeted a subset (11% by quantity) of all suppliers, which comprised 79% of total (direct and indirect) spend. The rationale for this coverage is the traditional Pareto Principle.

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

A Supplier Summit was held 9-10 January 2017 near our Minneapolis, Minnesota, headquarters. We presented overall strategies, including our Sustainable Enterprise initiative. The education-oriented content covered our product and value chain Life Cycle Assessment (LCA) findings. A significant piece of the presentation covered the tremendous insight gained from a value chain assessment and how that could help the suppliers determine appropriate action to reduce carbon emissions and other environmental impacts. We also shared the progress we've made on reducing carbon emissions and how we achieved that progress to date. We encouraged suppliers to inquire about potential partnerships and also share their own progress and ideas. One program launched at the Summit enabled collaborative suggestions from our suppliers. The program is built on an easy-to-use data platform and provides a mechanism to interact with each partner on their suggestions and track progress. We received more than 90 suggestions. One transportation/distribution supplier suggested they could report our Scope 3 emissions and perform an impact assessment. Measures of success include: percentage of invited suppliers who attended the Summit and percentage of attending suppliers who provided collaboration suggestions.

**Comment**

---

**Type of engagement**

Innovation & collaboration (changing markets)

**Details of engagement**

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

**% of suppliers by number**

1.8

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

7.7

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

2.2

**Rationale for the coverage of your engagement**

Planning for this campaign began in 2017. One direct material supplier group was selected for targeted supplier engagement. The selected group provides a good opportunity for Scope 1, Category 1 - Purchased Goods and Services emission reduction, based on upstream data from our full value chain assessment. The group represents about 10% of 2017 Scope 3, Category 1 total emissions and 2.2% of total Scope 3. The selected direct material group provides an even larger opportunity for Scope 3, Category 11 - Use of Sold Products emission reduction. Category 11 is more than 72% of our total Scope 3 emissions. A primary criteria in selecting the first direct material group for engagement was how much each category affects use of sold goods carbon emissions. In 2018 we will begin direct engagement with the selected group, using the strategy defined in 2017. (Note - engagement began in Q2 2018 - prior to CDP response submission.)

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

To be determined. This direct material supplier group offers the largest long-term opportunity for success.

**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

72.4

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

We communicate product and technology environmental advantages broadly, through all sales channels, and in a variety of ways. Specific product campaigns are also targeted to particular vertical markets.

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

Our detergent-free and on-site generation technologies have been very successful commercially. These technologies and products help customers achieve significant environmental footprint reductions. Since the introduction of ec-H2O in 2008, our customers' cumulative carbon emission reduction is more than 75,000 mT CO<sub>2</sub>e. The Orbio os3 and 5000-Sc on-site generation products have been well adapted in some markets and sales growth is consistent. These Orbio products also have the potential for significant customer carbon emission reduction, based on Life Cycle Assessment modeling.

---

## C12.1c

---

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

We installed electric vehicle (EV) charging infrastructure at two Minneapolis facilities in late 2015. We began evaluating EV infrastructure for our Uden, The Netherlands, facility in 2017. Providing such infrastructure encourages emission reduction in Scope 3, Category 7 - Employee Commuting.

## 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?

- Trade associations
- Funding research organizations

## 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**

American Association of Cleaning Equipment Manufacturers (AACEM)

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

Mixed

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

AACEM has not taken a position on climate change. AACEM is a subsidiary of the International Sanitary Supply Association (ISSA). AACEM serves and represents the interests of manufacturers of commercial and industrial powered cleaning equipment.

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

We have taken a position on climate change and committed to aggressive action to reduce our value chain emissions. Not all AACEM members hold a similar position on climate change. Tennant Company does not typically take positions on specific legislation.

---

**Trade association**

Electro Chemical Activation (ECA) Consortium A/S

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

Mixed

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

ECA Consortium A/S has not taken a position on climate change. ECA Consortium A/S is an International Non-Profit Association dedicated to promoting the use of ECA technology.

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

We have taken a position on climate change and committed to aggressive action to reduce our value chain emissions. Not all ECA Consortium A/S members hold a similar position on climate change. Tennant Company does not typically take positions on specific legislation.

---

**Trade association**

EUnited Cleaning

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

Mixed

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

EUnited Cleaning has not taken a position on climate change. EUnited Cleaning focuses on the industry sector producing cleaning systems for commercial and industrial use. EUnited Cleaning is part of The European Engineering Industries Association.

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

We have taken a position on climate change and committed to aggressive action to reduce our value chain emissions. Not all EUnited Cleaning members hold a similar position on climate change. Tennant Company does not typically take positions on specific legislation.

---

**C12.3d**

---

**(C12.3d) Do you publicly disclose a list of all research organizations that you fund?**

Yes

**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?**

Tennant has an internal policy on Political and Public Policy Activities.

It is the Company's policy not to make direct Political Contributions and to only engage in direct public policy activities where there are legal and support issues that directly affect our business objectives and protect or enhance the interests of our stakeholders. The Company's management will report any direct lobby efforts and direct Political Contributions to the Governance Committee of the Company's Board of Directors. Direct activities are an exception and must be reviewed and approved by the Board of Directors.

When we are determining whether to engage in an indirect activity, one consideration is whether the organization's mission is consistent with our vision, business strategies and Stewardship core value - leaving things in better condition than when we found them. Another consideration is whether the organization is focused on sustainability issues including climate change. These considerations in our engagement process have led us to partner with organizations that educate and advocate for responsible energy/resource use and other changes which benefit the environment.

Examples of trade and research organizations (indirect activities) where we engage include the Minnesota Sustainable Growth Coalition (MSGC), Environmental Initiative (EI), Canada Green Building Council (CaGBC), U.S. Green Building Council (USGBC), Twin Cities Conflict Minerals Task Force, Waste Wise Minnesota, NorthStar Initiative for Sustainable Enterprise (NiSE), ECA Consortium, EUnited Cleaning, International Sanitary Supply Association (ISSA), BSCAI, PRSM, SEAC, ABRALIMP, ABIMAQ, Cleaning Industry Research Initiative (CIRI), CEB/Gartner Human Resources Practice Group, Minnesota Chamber of Commerce, Minnesota Business Partnership, and Manufacturers Alliance for Productivity and Innovation (MAPI).

---

## C12.4

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

**Publication**

In voluntary sustainability report

**Status**

Underway – previous year attached

**Attach the document**

2016\_TNC\_CSR\_FINAL.PDF

**Content elements**

Governance

Strategy

Risks & opportunities

Emissions figures

Emission targets

Other metrics

---

## 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	President and Chief Executive Officer (CEO)	Chief Executive Officer (CEO)

## SC. Supply chain module

---

### SC0.0

---

**(SC0.0) If you would like to do so, please provide a separate introduction to this module.**

Engagement with the CDP Supply Chain program has benefited our business in a variety of ways - including cost savings and risk reduction. 2012 was the first year we compiled an inventory of our global GHG emissions, forming a baseline against which we compare future emissions and emission reductions. This is our sixth year of engagement. We've responded for reporting years 2012, 2013, 2014, 2015, 2016 and now 2017.

For reporting year 2014, we worked with Trucost S&P Global to perform our first Scope 3 value chain assessment. This Scope 3 assessment was updated for 2015, 2016 and 2017 reporting years in partnership with Trucost. In 2014, working with thinkstep, we performed a Life Cycle Assessment (LCA) on the T300 product - a new walk-behind scrubber-drier, launched in early 2015. This LCA provided a sound check-point for assessing embedded energy and emissions allocation approaches to our broad product range.

Based on this third-party LCA, we know that product use-phase is the major environmental impact contributor - by far - in our value chain. We also know the use of electricity and water are dominant in the use-phase environmental impacts of our largest product category, which is battery-powered floor scrubber-driers. We plan to continue performing product LCAs and evaluating allocation methods, to eventually cover our complete product range. In 2017 we initiated an LCA for our reconditioned equipment (RECON) offering.

In 2015, we committed to developing science-based targets for emissions reduction. Under the Science Based Target Initiative (SBTi) program, we developed a target for Scope 3 Category 11 - Use of Sold Products. This category is more than 70% of our 2017 Scope 3 emissions and important to our customers. We also developed a new target for Scope 1+2 emissions. These targets were submitted in 2017 and approved by SBTi in early 2018.

We remain committed to developing innovative technology and products which help our customers reduce their environmental impacts, including carbon emissions.

NOTE: Annual revenue cited in SC0.1 of \$1,003,066,000 includes the IPC Group (IPC) acquisition completed on April 6, 2017. IPC emissions are not included in Tennant Company 2017 reported emissions. Tennant Company plans to include IPC emissions for the 2018 fiscal reporting year. Since IPC emissions are not included for 2017, we have used annual revenue without IPC (\$828,622,000) as basis for allocating Scope 1+2 emissions to Requesting Members.

### SC0.1

---



---

**(SC0.1) What is your company's annual revenue for the stated reporting period?**

	Annual Revenue
Row 1	1003066000

**SC0.2**

---

**(SC0.2) Do you have an ISIN for your company that you would be willing to share with CDP?**

Yes

**SC0.2a**

---

**(SC0.2a) Please use the table below to share your ISIN.**

	ISIN country code (2 letters)	ISIN numeric identifier and single check digit (10 numbers overall)
Row 1	US	8803451033

**SC1.1**

---

**(SC1.1) Allocate your emissions to your customers listed below according to the goods or services you have sold them in this reporting period.**

**Requesting member**

The Coca-Cola Company

**Scope of emissions**

Scope 3

**Emissions in metric tonnes of CO<sub>2</sub>e**

1285

**Uncertainty (±%)**

5

**Major sources of emissions**

The major sources of these emissions are electricity or fuel use - depending on the product power source. Also water supply treatment and waste water treatment for those products which use water in their operation. This is our calculation of Scope 3, Category 11 - Use of Sold Products emissions for the specific products purchased by The Coca-Cola Company in 2017.

**Verified**

No

**Allocation method**

Allocation based on the number of units purchased

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**

GHG source was identified by Life Cycle Assessment (LCA) of representative products. Based on LCA, we developed and built a model to calculate our annual Scope 3 Category 11 - Use of Sold Products emissions. The model was then used to create a science-based target for Scope 3, Category 11. We have used this same model to calculate emissions associated with specific products purchased by The Coca-Cola Company in 2017.

---

**Requesting member**

The Coca-Cola Company

**Scope of emissions**

Scope 1

**Emissions in metric tonnes of CO<sub>2</sub>e**

45

**Uncertainty (±%)**

5

**Major sources of emissions**

Tennant Company manufacturing processes and facility heat, plus sales and service fleet vehicle fuel use.

**Verified**

No

**Allocation method**

Allocation based on the market value of products purchased

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**

Tennant Company enterprise wide GHG inventory. The allocation is based on our total reported Scope 1 emissions, total sales and sales to The Coca-Cola Company (all for 2017).

---

**Requesting member**

The Coca-Cola Company

**Scope of emissions**

Scope 2

**Emissions in metric tonnes of CO<sub>2</sub>e**

16

**Uncertainty (±%)**

5

**Major sources of emissions**

Tennant Company manufacturing processes, lighting, and other facility electricity use.

**Verified**

No

**Allocation method**

Allocation based on the market value of products purchased

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**

Tennant Company enterprise wide GHG inventory. The allocation is based on our total reported Scope 2 (market based) emissions, total sales and sales to The Coca-Cola Company (all for 2017).

---

**Requesting member**

W.W. Grainger, Inc.

**Scope of emissions**

Scope 3

**Emissions in metric tonnes of CO<sub>2</sub>e**

9199

**Uncertainty (±%)**

5

**Major sources of emissions**

The major sources of these emissions are electricity or fuel use - depending on the product power source. Also water supply treatment and waste water treatment for those products which use water in their operation. This is our calculation of Scope 3, Category 11 - Use of Sold Products emissions for specific products purchased by W.W. Grainger, Inc. (Grainger) in 2017. Since Grainger is a reseller, most if not all of these products are sold on to other customers. The emissions totaled here (9,199 mT CO<sub>2</sub>e) are not likely Scope 1 or 2, they are most likely Scope 3, Category 11 for Grainger.

**Verified**

No

**Allocation method**

Allocation based on the number of units purchased

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**

GHG source was identified by Life Cycle Assessment (LCA) of representative products. Based on LCA, we developed and built a model to calculate our annual Scope 3 Category 11 - Use of Sold Products emissions. The model was then used to create a science-based target for Scope 3, Category 11. We have used this same model to calculate emissions associated with specific products purchased by W.W. Grainger, Inc. in 2017.

---

**Requesting member**

W.W. Grainger, Inc.

**Scope of emissions**

Scope 1

**Emissions in metric tonnes of CO2e**

336

**Uncertainty (±%)**

5

**Major sources of emissions**

Tennant Company manufacturing processes and facility heat, plus sales and service fleet vehicle fuel use.

**Verified**

No

**Allocation method**

Allocation based on the market value of products purchased

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**

Tennant Company enterprise wide GHG inventory. The allocation is based on our total reported Scope 1 emissions, total sales and sales to W.W. Grainger, Inc. (all for 2017).

---

**Requesting member**

W.W. Grainger, Inc.

**Scope of emissions**

Scope 2

**Emissions in metric tonnes of CO2e**

120

**Uncertainty (±%)**

**Major sources of emissions**

Tennant Company manufacturing processes, lighting, and other facility electricity use.

**Verified**

No

**Allocation method**

Allocation based on the market value of products purchased

**Please explain how you have identified the GHG source, including major limitations to this process and assumptions made**

Tennant Company enterprise wide GHG inventory. The allocation is based on our total reported Scope 2 (market based) emissions, total sales and sales to W.W. Grainger (all for 2017).

---

SC1.2

---

**(SC1.2) Where published information has been used in completing SC1.1, please provide a reference(s).**

Sales to Requesting Members and the specific products purchased are used to calculate Scope 3 emissions. We do not make this information public. Requesting Members should contact their Tennant Company Account Manager to obtain this information.

Published information for 2017 Scope 1+2 emissions can be found at:

[https://www.tennantco.com/en\\_us/about-us/corporate-citizenship/sustainability.html](https://www.tennantco.com/en_us/about-us/corporate-citizenship/sustainability.html)

**SC1.3**

**(SC1.3) What are the challenges in allocating emissions to different customers, and what would help you to overcome these challenges?**

Allocation challenges	Please explain what would help you overcome these challenges
Diversity of product lines makes accurately accounting for each product/product line cost ineffective	In 2017 we developed a framework, methodology, and tool for more accurately calculating our Scope 3, Category 11 "Use of Sold Products" emissions. The tool includes the majority of our product portfolio. This tool was used to set a science-based target for reducing Scope 3, Category 11 "Use of Sold Products" emissions. And the target was approved by the Science Based Targets initiative in early 2018. Using this new tool for 2017 Scope 3 emission allocation to Requesting Members is a significant improvement over the previous methodology. Many of our products have multiple configurations and options available. They can also be operated at various settings. Both of these factors make it difficult for exact accounting of emissions. We use representative, average machine configurations and normal operation conditions in the new tool described above. As an independent quality check, 2016 and 2017 Use of Sold Products emissions were verified by Trucost. We have performed Life Cycle Assessments (LCAs) for representative products. The LCA work is helpful in defining reasonable assumptions for product based accounting. We strive for continuous improvement in the methods used to allocate emissions to different customers.

**SC1.4**

**(SC1.4) Do you plan to develop your capabilities to allocate emissions to your customers in the future?**

Yes

**SC1.4a**

**(SC1.4a) Describe how you plan to develop your capabilities.**

As we conduct additional LCAs and refine assumptions, we will enhance the accuracy of Scope 3 allocation to customers if appropriate.

Long term, we expect all products will have internet-of-things capabilities like the IRIS system we currently offer. This capability could provide specific customer use data, which would be most accurate.

**SC2.1**

**(SC2.1) Please propose any mutually beneficial climate-related projects you could collaborate on with specific CDP Supply Chain members.**

**Requesting member**

The Coca-Cola Company

**Group type of project**

Relationship sustainability assessment

**Type of project**

Assessing products or services life cycle footprint to identify efficiencies

**Emissions targeted**

Actions to reduce customers' operational emissions (customer scope 1 & 2)

**Estimated timeframe for carbon reductions to be realized**

1-3 years

**Estimated lifetime CO2e savings**

**Estimated payback**

Please select

**Details of proposal**

Assess GHG footprint of current Tennant and related products owned and operated by The Coca-Cola Company and/or business partners. Determine if there are GHG emissions reduction opportunities by adjusting the product portfolio via future purchases. As part of the assessment, we would provide estimated lifetime CO2e savings and estimated payback.

---

**Requesting member**

W.W. Grainger, Inc.

**Group type of project**

Relationship sustainability assessment

**Type of project**

Assessing products or services life cycle footprint to identify efficiencies

**Emissions targeted**

Actions to reduce customers' operational emissions (customer scope 1 & 2)

**Estimated timeframe for carbon reductions to be realized**

1-3 years

**Estimated lifetime CO2e savings**

**Estimated payback**

Please select

**Details of proposal**

Assess GHG footprint of current Tennant and related products owned and operated by W.W. Grainger, Inc. and/or business partners, as well as products Grainger resells. Determine if there are GHG emissions reduction opportunities by adjusting the product portfolio via future purchases. As part of the assessment, we would provide estimated lifetime CO2e savings and estimated payback.

---

**SC2.2**

---

**(SC2.2) Have requests or initiatives by CDP Supply Chain members prompted your organization to take organizational-level emissions reduction initiatives?**

No

**SC3.1**

---

**(SC3.1) Do you want to enroll in the 2018-2019 CDP Action Exchange initiative?**

Yes

### SC3.1a

---

**(SC3.1a) Identify which member(s), if any, have motivated you to take part in Action Exchange this year.**

Please select

### SC3.1b

---

**(SC3.1b) Select the types of emissions reduction activities that your company would like support in analyzing or in implementing in the next reporting year.**

Energy efficiency: Building fabric

Energy efficiency: Building services

Energy efficiency: Processes

Process emissions reductions

Transportation: fleet

Transportation: use

Product design

Behavioral change

### SC3.1c

---

**(SC3.1c) As part of Action Exchange, would you like facility level analysis?**

Yes

### SC3.2

---

**(SC3.2) Is your company a participating supplier in CDP's 2017-2018 Action Exchange initiative?**

No

### SC4.1

---

**(SC4.1) Are you providing product level data for your organization's goods or services, if so, what functionality will you be using?**

Yes, I will provide data

### SC4.1a

---

**(SC4.1a) Give the overall percentage of total emissions, for all Scopes, that are covered by these products.**

11

### SC4.2a

---

(SC4.2a) Complete the following table for the goods/services for which you want to provide data.

**Name of good/ service**

T300

**Description of good/ service**

Walk-behind, battery-powered, scrubber-drier

**Type of product**

Final

**SKU (Stock Keeping Unit)**

Many T300 family product variants with unique SKUs

**Total emissions in kg CO<sub>2</sub>e per unit**

3976.7

**±% change from previous figure supplied**

-11

**Date of previous figure supplied**

**Explanation of change**

Updated emissions from "Consumer Use" lifecycle phase by using 2017 eGRID US average emission factor. Updated total emissions per unit is a reduction of 492 kg CO<sub>2</sub>e, or 11% less than prior total (4468.7 kg CO<sub>2</sub>e).

**Methods used to estimate lifecycle emissions**

Other, please specify (Process LCA (cradle-to-grave))

---

SC4.2b

---

(SC4.2b) Complete the following table with data for lifecycle stages of your goods and/or services.

**Name of good/ service**

T300

**Please select the scope**

Scope 1 & 2

**Please select the lifecycle stage**

Cradle to gate

**Emissions at the lifecycle stage in kg CO<sub>2</sub>e per unit**

827

**Is this stage under your ownership or control?**

Yes

**Type of data used**

Primary and secondary

**Data quality**

Good - includes the impact for some metal parts which we manufacture internally

**If you are verifying/assuring this product emission data, please tell us how**

---

**Name of good/ service**

T300

**Please select the scope**

Scope 1 & 2

**Please select the lifecycle stage**

Manufacturing

**Emissions at the lifecycle stage in kg CO<sub>2</sub>e per unit**

152

---

**Is this stage under your ownership or control?**

Yes

**Type of data used**

Primary and secondary

**Data quality**

Good - includes Tennant rotomold parts fabrication and assembly

**If you are verifying/assuring this product emission data, please tell us how**

---

**Name of good/ service**

T300

**Please select the scope**

Scope 3

**Please select the lifecycle stage**

Distribution

**Emissions at the lifecycle stage in kg CO2e per unit**

41.7

**Is this stage under your ownership or control?**

Yes

**Type of data used**

Primary and secondary

**Data quality**

Good - Assumes average shipping distance in US

**If you are verifying/assuring this product emission data, please tell us how**

---

**Name of good/ service**

T300

**Please select the scope**

Scope 3

**Please select the lifecycle stage**

Consumer Use

**Emissions at the lifecycle stage in kg CO2e per unit**

3135

**Is this stage under your ownership or control?**

No

**Type of data used**

Primary and secondary

**Data quality**

Good - Assumes US average 2017 eGRID emissions factor for electricity used. Update for 2017 gives reduction of 492 kg CO2e compared to prior total (3,627 kg CO2e).

**If you are verifying/assuring this product emission data, please tell us how**

---

**Name of good/ service**

T300

**Please select the scope**

Please select

**Please select the lifecycle stage**

End of life/Final disposal

**Emissions at the lifecycle stage in kg CO2e per unit**

0

---



**Is this stage under your ownership or control?**

No

**Type of data used**

Primary and secondary

**Data quality**

Good - Assumes all metals are recycled. The T300 LCA used the substitution approach for end-of-life, which results in a "credit" for emissions at this lifecycle stage of -179 kg CO2e. The input field does not allow negative numbers, so "0" was entered.

**If you are verifying/assuring this product emission data, please tell us how**

---

SC4.2c

---

**(SC4.2c) Please detail emissions reduction initiatives completed or planned for this product.**

Name of good/ service	Initiative ID	Description of initiative	Completed or planned	Emission reductions in kg CO2e per unit
-----------------------	---------------	---------------------------	----------------------	---

SC4.2d

---

**(SC4.2d) Have any of the initiatives described in SC4.2c been driven by requesting CDP Supply Chain members?**

No

Submit your response

---

**In which language are you submitting your response?**

English

**Please confirm how your response should be handled by CDP**

	Public or Non-Public Submission	I am submitting to	Are you ready to submit the additional Supply Chain Questions?
I am submitting my response	Public	Customers	<Not Applicable>

**Please confirm below**

I have read and accept the applicable Terms