

Trucost  
ESG Analysis

S&P Global

# Tennant Company Value Chain Footprint

Financial Year 2018



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## Introduction

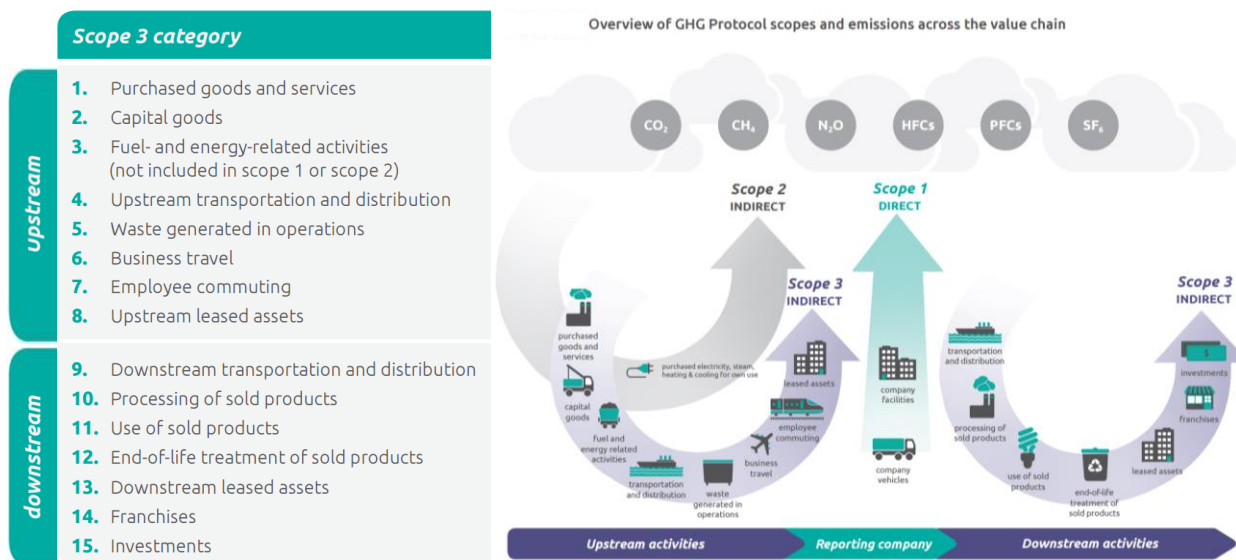
Tennant Company (henceforth Tennant) engaged Trucost to assess its value chain greenhouse gas (GHG) emissions in line with the WRI/WBCSD Corporate Value Chain (scope 3) Guidelines (GHG Protocol). The assessment allows Tennant to report its emissions according to the fifteen scope 3 categories outlined in the Guidelines.

Tennant has already been reporting its GHG emissions to CDP for multiple years. This project supports Tennant’s ongoing efforts in GHG emissions disclosure by calculating and modeling its scope 3 emissions. Using data provided by Tennant and Trucost’s database of GHG emissions by industry sector and business activity, Trucost calculated the GHG footprint for four Scope 3 GHG emission categories and combined this with other relevant Scope 3 categories calculated by Tennant independently, to create a value chain emissions profile including all relevant scope 3 categories. Finally, Trucost identified opportunities for potential emission reductions within Tennant’s value chain.

## Project Scope

Exhibit 1 below outlines the GHG Protocol’s fifteen upstream and downstream scope 3 categories. Trucost estimated the GHG emissions of each category using the Trucost Environmentally Extended Input-Output (EEI-O) model along with primary data, where available, for all upstream and downstream categories. Primary data included Tennant’s spend combined with the EEI-O model to estimate impacts, as well as existing research conducted by Tennant related to its GHG emissions.

**Exhibit 1: Scope of value chain GHG emissions footprint<sup>1</sup>**



<sup>1</sup> Figure from the GHG Protocol’s *Corporate Value Chain (Scope 3) Accounting and Reporting Standard*  
[trucost.com](https://www.trucost.com)

Trucost calculated the GHG footprint for four Scope 3 GHG emission categories, namely:

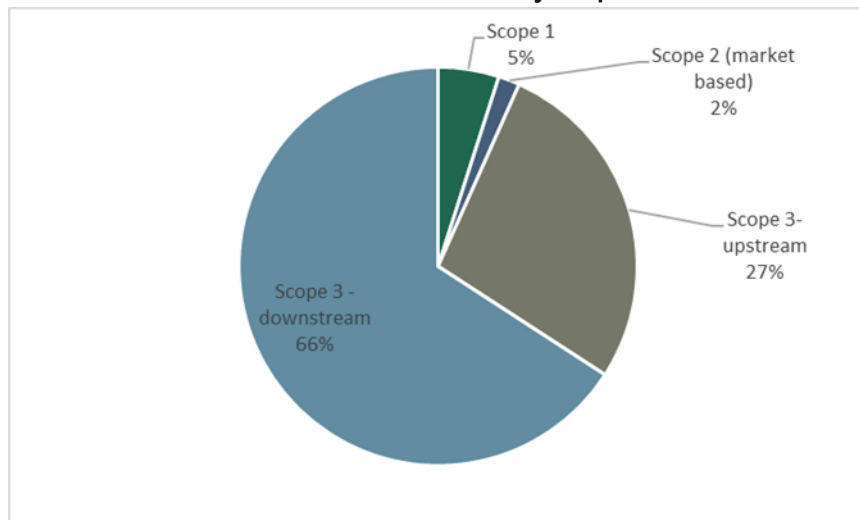
- 1: Purchased goods and services
- 4: Upstream transportation and distribution
- 7: Employee commuting
- 9: Downstream transportation

Furthermore, scope 1 and 2, and scope 3, category 11 Use of sold products, were calculated by Tennant and incorporated into the total figures.

### Key findings

In FY2018, Tennant’s value chain (scope 3) was responsible for an estimated 517,340 metric tons of GHG emissions (tCO<sub>2</sub>e), which is approximately 93% of its total estimated GHG inventory of 554,351 tCO<sub>2</sub>e. Exhibit 2 below displays the emissions split among scopes 1, 2, 3-upstream and 3-downstream, calculated to be approximately 27,403 tCO<sub>2</sub>e (calculated by Tennant), 9,608 tCO<sub>2</sub>e (market-based emissions calculated by Tennant), 152,386 tCO<sub>2</sub>e (estimated by Trucost) and 364,954 tCO<sub>2</sub>e (calculated by Tennant), respectively. Tennant shared its scope 1 and scope 2 and scope 3, category 11 calculated emissions, for Trucost’s assurance of those emissions. Detailed figures can be seen in Exhibit 3.

Exhibit 2: Tennant value chain emissions by scope



**The GHG Protocol Corporate Standard classifies a company’s GHG emissions into three ‘scopes’.**

- **Scope 1** emissions are direct emissions from owned or controlled sources
- **Scope 2** emissions are indirect emissions from the generation of purchased energy
- **Scope 3** emissions are all indirect (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions

**Exhibit 3: Tennant value chain emissions by scope - detail**

| Source of emission     | 2018 GHG emissions (tCO <sub>2</sub> e) | Percentage contribution |
|------------------------|---|-------------------------|
| Scope 1                | 27,403                                  | 4.94%                   |
| Scope 2 (market based) | 9,608                                   | 1.73%                   |
| Scope 3- upstream      | 152,386                                 | 27.49%                  |
| Scope 3 - downstream   | 364,954                                 | 65.83%                  |
| Total                  | 554,351                                 | 100.00%                 |

Exhibit 4 presents a detailed breakdown of Tennant’s GHG emissions per scope 3 category, highlighting the hotspots with the greatest emissions. Tennant and Trucost identified three of the fifteen scope 3 categories as relevant, based on business activities and related GHG emissions.

Given the change in methodological approach adopted for reporting year 2017, category 9 Downstream transportation and distribution is not relevant, but calculated for reference. Furthermore, with the overall reduction of Employee commuting emissions, this falls just slightly below the materiality threshold of 1% of total footprint.

## Tennant Company Value Chain GHG footprint: FY2018

Exhibit 4: Tennant value chain GHG emissions, FY2018

| Value chain (Scope 3) category                | 2018 GHG emissions (tCO <sub>2</sub> e) | Percentage contribution to scope 3% | Relevance <sup>2</sup>   | GHG social cost (\$million) <sup>3</sup> |
|---|---|-------------------------------------|--------------------------|--|
| 1) Purchased goods and services               | 121,897                                 | 23.6%                               | Relevant                 | \$16                                     |
| 2) Capital goods                              | *                                       | *                                   | Not relevant             | *  |
| 3) Fuel- and energy-related activities        | *                                       | *                                   | Not relevant             | *  |
| 4) Upstream transportation and distribution   | 25,904                                  | 5.0%                                | Relevant                 | \$3                                      |
| 5) Waste generated in operations              | *                                       | *                                   | Not relevant             | *  |
| 6) Business travel                            | *                                       | *                                   | Not relevant             | *  |
| 7) Employee commuting                         | 4,585                                   | 0.9%                                | Not relevant, calculated | \$1                                      |
| 8) Upstream leased assets                     | *                                       | *                                   | Not relevant             | *  |
| 9) Downstream transportation and distribution | 142                                     | <0.1%                               | Not relevant, calculated | \$0.02                                   |
| 10) Processing of sold products               | *                                       | *                                   | Not relevant             | *  |
| 11) Use of sold products                      | 364,812                                 | 70.5%                               | Relevant                 | \$47                                     |
| 12) End-of-life treatment of sold products    | *                                       | *                                   | Not relevant             | *  |
| 13) Downstream leased assets                  | *                                       | *                                   | Not relevant             | *  |
| 14) Franchises                                | *                                       | *                                   | Not relevant             | *  |
| 15) Investment                                | *                                       | *                                   | Not relevant             | *  |
| <b>TOTAL</b>                                  | <b>517,340</b>                          | <b>100%</b>                         |                          | <b>\$67</b>                              |

\* Tennant and Trucost determined this category to be not relevant to Tennant's business activities and did not estimate the associated GHG emissions.

As has been apparent in previous years, the majority of GHG emissions from Tennant's value chain are associated with downstream sources, most significantly, use of sold products which accounts for 70.5%.

<sup>2</sup> Relevance based on 1% threshold relative to total scope 3 emissions inventory.

<sup>3</sup> GHG social costs account for the societal impacts of GHG emissions; priced at \$129/tCO<sub>2</sub>e in 2018 with inflation taken into account ([www3.epa.gov/climatechange/EPAactivities/economics/scc.html](http://www3.epa.gov/climatechange/EPAactivities/economics/scc.html)).

## Year-on-year comparison

Tennant strives to refine methodological approach and improve performance each year. Following a change to methodological approach for reporting year 2017 for scope 3 categories 4 & 9 –Transportation and distribution, and category 11 – Use of sold products, there have been no further methodological changes, however 2016 emissions were retrospectively adjusted where possible. There was, however, a change in granularity of assessment, with Tennant providing data for its operations in Brazil, which has associated emissions incorporated into the total GHG footprint.

**Exhibit 5: Tennant value chain GHG emissions, year-on-year**

| Emission Scope       | Emission Source              | 2018 GHG Emissions (tCO <sub>2</sub> e) | 2017 GHG Emissions (tCO <sub>2</sub> e) | 2016 GHG Emissions (tCO <sub>2</sub> e) |
|----------------------|------------------------------|---|---|---|
| Scope 3, Category 1  | Purchased goods and services | 121,897                                 | 111,145                                 | 106,216                                 |
| Scope 3, Category 4  | Upstream transportation      | 25,904                                  | 20,365                                  | 19,246                                  |
| Scope 3, Category 7  | Employee commuting           | 4,585                                   | 6,972                                   | 7,822                                   |
| Scope 3, Category 9  | Downstream transportation    | 142                                     | 116                                     | -                                       |
| Scope 3, Category 11 | Use of sold products         | 364,812                                 | 367,060                                 | 386,804                                 |
| Total                |                              | 517,340                                 | 505,658                                 | 520,088                                 |

## CDP reporting data

Exhibit 6 outlines the process for evaluating each scope 3 category, along with the estimated emissions for each category. Tennant can use this information to complete its CDP questionnaire for scope 3 emissions and/or for other reporting purposes.



**Exhibit 6: Tennant scope 3 methodologies and findings – suitable for external reporting**

| SOURCE OF SCOPE 3 EMISSIONS                 | EVALUATION STATUS <sup>4</sup> | GHG (tCO <sub>2</sub> e) | EMISSIONS CALCULATION METHODOLOGY  | % OF SCOPE 3 EMISSIONS |
|---|--------------------------------|--------------------------|--|------------------------|
| 1) Purchased goods and services             | Relevant, calculated           | 121,897                  | 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 FY2018 and the previous analyses. Trucost scaled emissions from FY2017 to the 2018 spend amount, assuming the same proportional spend and exclusions.<br>For the new data granularity for Brazil, Trucost mapped spend categories to sectors in its proprietary environmentally extended input-output (EEI-O) model. | 24%                    |
| 2) Capital goods                            | Not relevant, not calculated   | *                        | N/A  | *                      |
| 3) Fuel- and energy-related activities      | Not relevant, not calculated   | *                        | N/A  | *                      |
| 4) Upstream transportation and distribution | Relevant, calculated           | 25,904                   | 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.  | 5%                     |
| 5) Waste generated in operations            | Not relevant, not calculated   | *                        | N/A  | *                      |
| 6) Business travel                          | Not relevant, not calculated   | *                        | N/A  | *                      |
| 7) Employee commuting                       | Not relevant, calculated       | 4,585                    | Trucost estimated employee commuting emissions using Tennant’s global employee head count and country averages for commuting time, transportation mode and distance  | 0.9%                   |
| 8) Upstream leased assets                   | Not relevant, not calculated   | *                        | N/A  | *                      |

\* Tennant and Trucost determined this category to be not relevant to Tennant’s business activities and did not estimate the associated GHG emissions.

<sup>4</sup> Relevance based on 1% threshold relative to total scope 3 emissions inventory.



Tennant Company Value Chain GHG footprint: FY2018

| SOURCE OF SCOPE 3 EMISSIONS                   | EVALUATION STATUS <sup>5</sup> | GHG (tCO <sub>2</sub> e) | EMISSIONS CALCULATION METHODOLOGY  | % OF SCOPE 3 EMISSIONS |
|---|--------------------------------|--------------------------|--|------------------------|
| 9) Downstream transportation and distribution | Not relevant, calculated       | 142                      | Using proportional spend to distribution centers, Trucost estimated farther 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 travelled 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. | <0.1%                  |
| 10) Processing of sold products               | Not relevant, not calculated   | *                        | N/A  | *                      |
| 11) Use of sold products                      | Relevant, calculated           | 364,812                  | Tennant calculated.  | 70.5%                  |
| 12) End-of-life treatment of sold products    | Not relevant, not calculated   | *                        | N/A  | *                      |
| 13) Downstream leased assets                  | Not relevant, not calculated   | *                        | N/A  | *                      |
| 14) Franchises                                | Not relevant, not calculated   | *                        | N/A  | *                      |
| 15) Investment                                | Not relevant, not calculated   | *                        | N/A  | *                      |

\* Tennant and Trucost determined this category to be not relevant to Tennant’s business activities and did not estimate the associated GHG emissions.

<sup>5</sup> Relevance based on 1% threshold relative to total scope 3 emissions inventory.

## Appendix I: Methodology by scope 3 category

| EMISSIONS SOURCE  | METHODOLOGY                                       | TRUCOST CALCULATION STEPS   | REFERENCE   | REMARKS  |
|---|---|---|---|--|
| Scope 3, Category 1: Purchased goods and services             | Calculated using Trucost EEI-O model              | 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 FY2018 and the previous analyses. Trucost scaled emissions from FY2017 to the FY2018 spend amount, assuming the same proportional spend and exclusions  | Tennant 2018 spend data and previous analysis findings  | More granular data for Brazil spend was included by mapping broadly to sectors by type of procurement.                     |
| Scope 3, Category 2: Capital goods                            | Not calculated                                    | Tennant and Trucost determined this category to be not relevant, based on the analysis of 2014 data   |   |  |
| Scope 3, Category 3: Fuel- & energy-related activities        | Not calculated                                    | Tennant and Trucost determined this category to be not relevant, based on the analysis of 2014 data   |   |  |
| Scope 3, Category 4: Upstream transportation and distribution | Calculated using Trucost EEI-O model              | Applying Tennant's spend by transportation mode Trucost used the EEI-O model to calculate the GHG emissions for the different transportation modes associated with the spend amount   | Tennant 2018 spend data and previous analysis findings  | Tennant 2018 logistics spend split by transportation mode  |
| Scope 3, Category 5: Waste generated in operations            | Not calculated                                    | Tennant and Trucost determined this category to be not relevant, based on the analysis of 2014 data   |   |  |
| Scope 3, Category 6: Business travel                          | Not calculated                                    | Tennant and Trucost determined this category to be not relevant, based on the analysis of 2014 data   |   |  |
| Scope 3, Category 7: Employee commuting                       | Estimated based on employee head count by country | <ol style="list-style-type: none"> <li>1. Based on OECD data and number of working days in each country and Tennant's employee headcount, average commuting time spent in 2018 was calculated.</li> <li>2. Applied country-specific modal split (if unavailable, applied average) to total commuting time of all employees in each country.</li> <li>3. Using average time spent per transportation mode, total travel distance per transportation mode was calculated.</li> <li>4. Applied Defra emissions factors per transportation mode.</li> </ol> | Tennant employee headcounts and country averages for commuting time, transportation mode and distance | Tennant 2018 employee headcount by country<br>OECD statistics on commuting time<br>U.S. American Community Survey<br>DEFRA |

Tennant Company Value Chain GHG footprint: FY2018

| EMISSIONS SOURCE  | METHODOLOGY  | TRUCOST CALCULATION STEPS  | REFERENCE  | REMARKS                             |
|---|--|--|--|-------------------------------------|
| Scope 3, Category 8: Upstream leased assets                     | Not calculated   | Tennant and Trucost determined this category to be not relevant, based on the analysis of 2014 data                                  |  |                                     |
| Scope 3, Category 9: Downstream transportation and distribution | Calculated using Tennant product information, applying mass to sold products, and calculating onward tkm travelled by goods. | Based on new analysis, this is determined to be 'not relevant'.  | Tennant 2018 spend data, US Department of Transportation statistics and Defra emission factors for freighted goods | Consider removing for 2020 analysis |
| Scope 3, Category 10: Processing of sold products               | Not calculated   | Tennant and Trucost determined this category to be not relevant, based on the analysis of 2014 data                                  |  |                                     |
| Scope 3, Category 11: Use of sold products                      | Calculated by Tennant  |  |  |                                     |
| Scope 3, Category 12: End-of-life treatment of sold products    | Not calculated   | Tennant and Trucost determined this category to be not relevant to Tennant's business activities, based on the analysis of 2014 data |  |                                     |
| Scope 3, Category 13: Downstream leased assets                  | Not calculated   | Tennant and Trucost determined this category to be not relevant, based on the analysis of 2014 data                                  |  |                                     |
| Scope 3, Category 14: Franchises                                | Not calculated   | Tennant and Trucost determined this category to be not relevant, based on the analysis of 2014 data                                  |  |                                     |
| Scope 3, Category 15: Investment                                | Not calculated   | Tennant and Trucost determined this category to be not relevant, based on the analysis of 2014 data                                  |  |                                     |

## Appendix II: The Trucost EEI-O Model

Since its founding in 2000, Trucost developed an environmental economic input output (EEI-O) life cycle based model for quantifying environmental impacts. The EEI-O model uses an economic modelling technique based on extensive government census data to analyze the products used and produced by over 464 business activities or sectors. The model also describes the economic interactions between each sector.

Trucost has improved upon standard EEI-O models in several ways, resulting in what we believe is a best in class model for analyzing environmental performance. These improvements include the following:

- Trucost has integrated the use and emissions of over 700 environmental resources. By applying a price to each environmental resource, based on the environmental impact of that resource, the model is able to analyze, in financial terms, the economic and environmental performance of each sector. This environmental performance measure incorporates the indirect, supply chain impacts by using the information on the interactions between sectors.
- Trucost maintains and updates its model annually to reflect market commodity flows. We annually update our sector revenue for all sectors, producer prices and annual production quantities for all primary sectors in our model.
- Environmental intensities for all sectors are also reviewed annually against companies' public disclosures from our annual engagement programs. Trucost engages with more than 6,000 companies directly to obtain environmental performance metrics, which are then considered against sector environmental intensity.

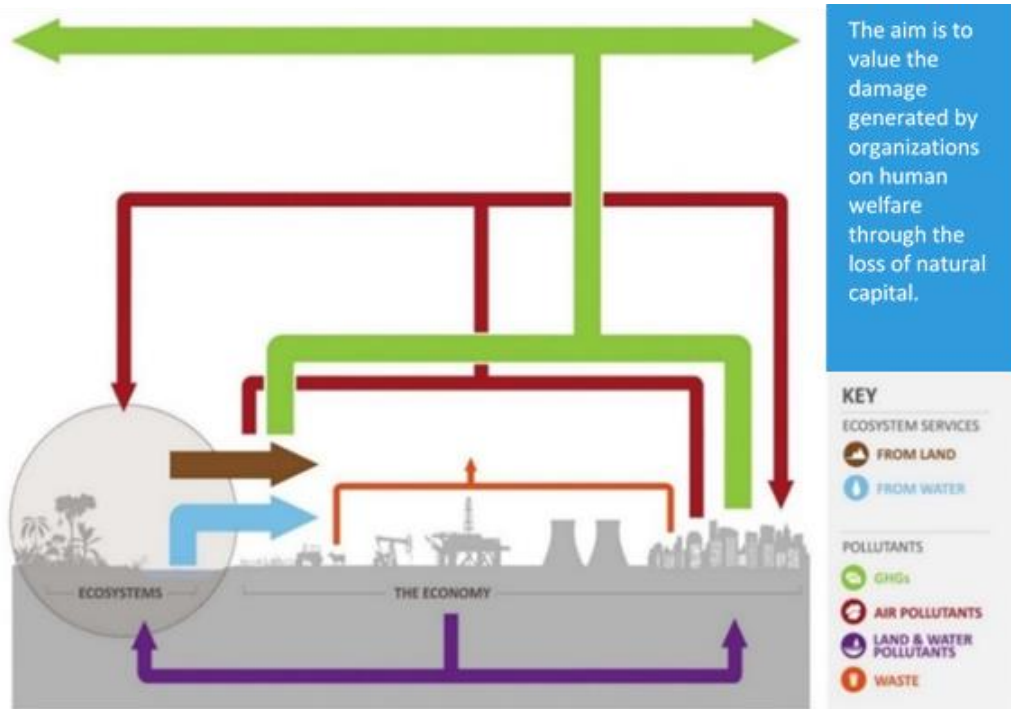
## Appendix II: Natural capital valuation

Natural capital can be defined as the world's stocks of natural resources which make human life possible. Organizations rely on this natural capital to produce goods and deliver services. They depend on natural non-renewable resources (for example, fossil fuels and minerals) as well as natural renewable ecosystem goods and services (for example, freshwater and pollination). Organizations also rely on natural capital for its ability to absorb by-products of production, such as pollution and waste. This ability is finite and has already shown its limits, with climate change caused by GHG emissions. The interrelationship between impacts and dependencies is described in the figure below.

Business extraction and production activities can damage natural capital with long term economic and social consequences, which are more often paid by those affected rather than those responsible. The cost of natural capital is impacting organizations directly and through their supply chains. Organizations that fail to adapt in a world of increasingly scarce but historically free resources will lose competitiveness as their value is realized through tighter regulation.

Trucost relies on over 1,000 environmental valuations identified in peer-reviewed journals, as well as government studies to estimate the global average valuation of the six key performance indicator (KPIs) – GHG emissions, air pollution, water use, land and water pollution, and land use changes.

Exhibit 14: Natural capital infographic



Source: Trucost 2012

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