TRANSPOWER

CARBON FOOTPRINT 2015-16

Summary Report

Contents

1.Key Findings

- *Our total greenhouse gas (GHG) emissions for 2015/16 are estimated at 181,200 tCO_2-e (tonnes of carbon dioxide equivalent) – an increase of 0.5% from last year. This year we extended the GHG Protocol Scope boundaries to include transmission losses from our network in Scope 2.*
- *Operational emissions (excluding emissions from transmission losses) are estimated at 8,960 500 t CO_2-e.*
- *CAPEX spending has decreased by 36% compared to 2014/15.*
- *GHG emissions are estimated at 253t CO_2-e per FTE; 0.5% higher than last year.*
- *Scope 1 and 2 emissions contribute 99% towards our total organisational carbon footprint.*
- *Transmission loss is by far the largest source of our emissions, accounting for 95% of our overall emissions and for 99% of the Scope 2 emissions. We have little control over transmission losses – please refer to Section 5 for further information.*
- *SF_6 emissions continue to be the single largest Scope 1 emission source, contributing 91% of the Scope 1 emissions. Compared to last year, SF_6 emissions increased by 32%. The emission rate (emissions/capacity) has fallen steadily over the past six years; however, over the last 12 months the rate has increased from 0.38% in 2014/15 to 0.50% in 2015/16.*
- *The third largest contributor to our 2015/16 carbon footprint is electricity consumption at substations (0.9% of the total emissions, or 17.5% of our operational emissions excluding transmission losses).*
- *Emissions associated with employee air travel decreased by 1.3% compared to last year; land transport emissions remained at last year's level increasing by 0.2%.*
- *A materiality review of all the direct and indirect emission sources indicates that the current carbon footprint accounts for 99% of Scope 1 & 2 emissions and 95% of the total value chain emissions (including Scope 3).*

2.2015-16 Emissions profile

2.1 By activity

Figure 1 outlines our overall carbon footprint and the contributions by each emission source. Transmissions losses account for 95% of total greenhouse gas emissions, with synthetic gas emission contributions of 3%.

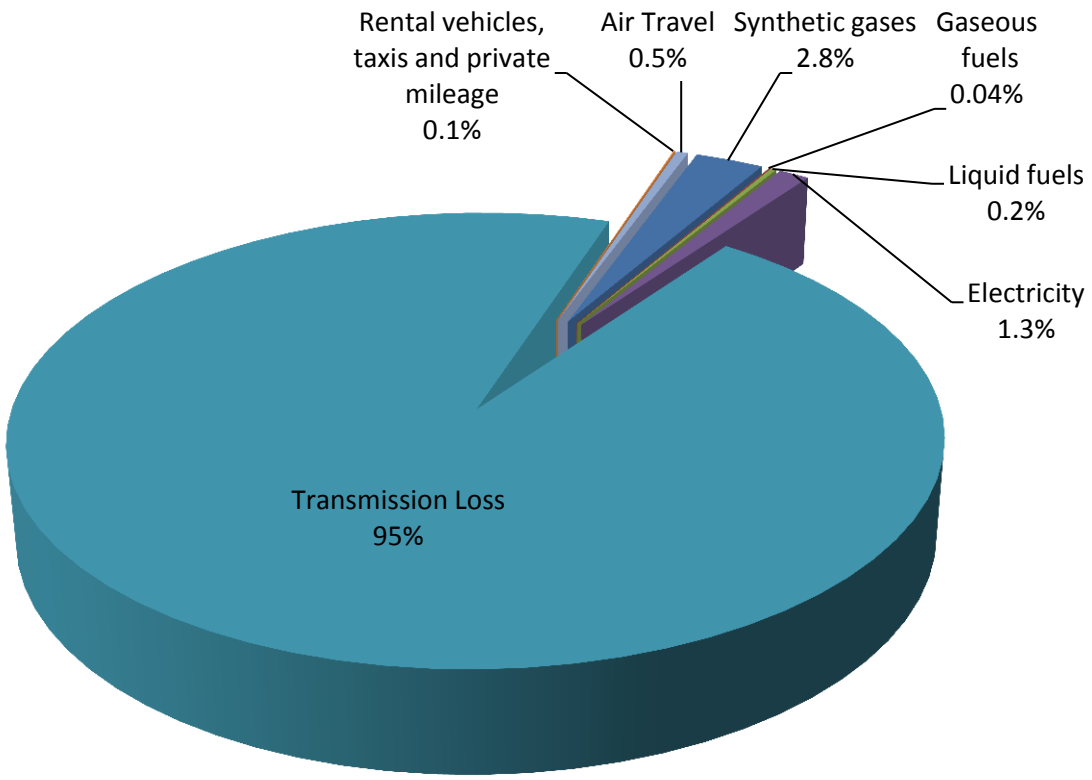


Figure 1 Greenhouse gas emissions by source

Figure 2 shows the contribution of various activities and processes to our operational carbon footprint, excluding transmission losses. Similar to last year sulphur hexafluoride (SF_6) is the single largest source of emissions. However, despite significant reductions in previous years, emissions from SF_6 stock and losses have increased from 48% to 57% of our operational emissions in 2015-2016 (see Section 3.2). The second largest single contributor to our operational carbon footprint is electricity consumption (specifically at substations).

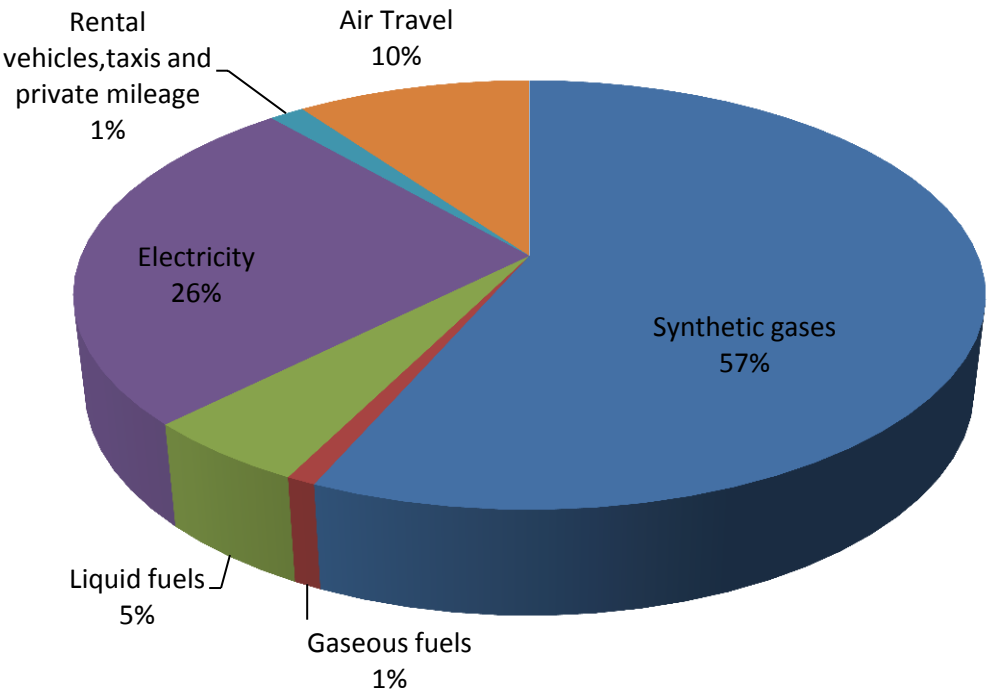


Figure 2 Greenhouse gas emissions by source (excluding Transmission Losses)

2.2 By scope

Figure 3 shows that with the addition of transmission losses to the reporting boundary, Scope 2 emissions clearly dominate our overall emissions profile. Scope 1 covers the emissions over which we have direct operational control. Scope 2 covers the indirect emissions associated with electricity consumption and overall transmission losses in the Transpower network, and Scope 3 covers selected indirect emissions over which we have less control.

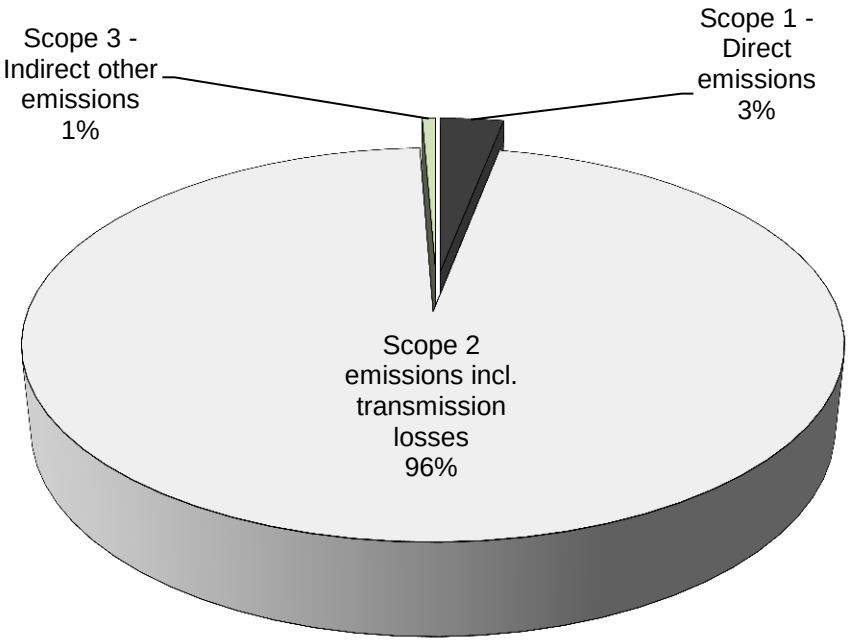


Figure 3 Greenhouse gas emissions by scope (operational including transmission losses)

Figure 4 illustrates our operational emissions profile. When excluding emissions from transmission losses, Scope 1 emissions take a more dominant role, specifically emissions from SF_6 stock and losses.

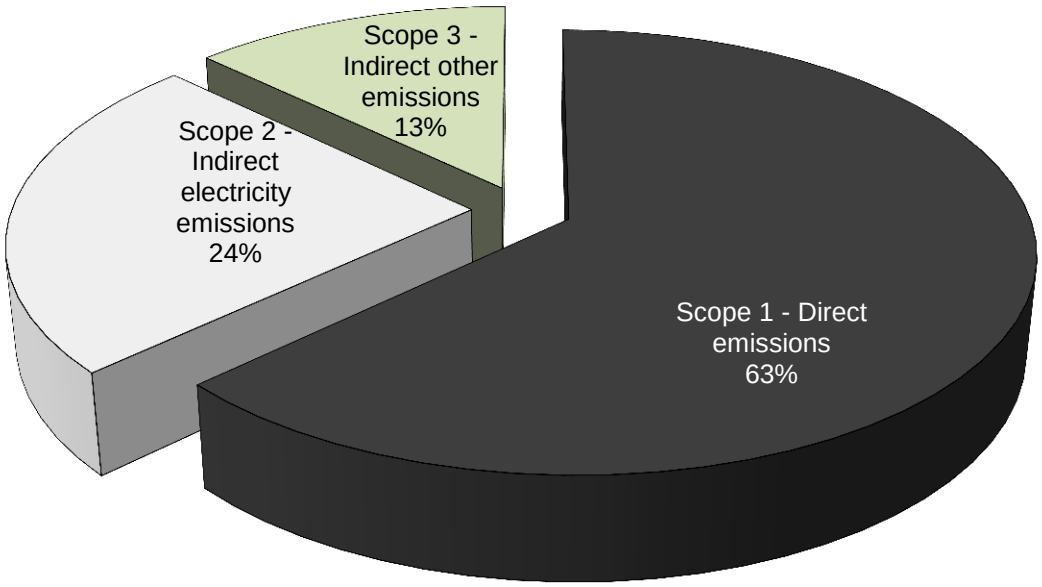
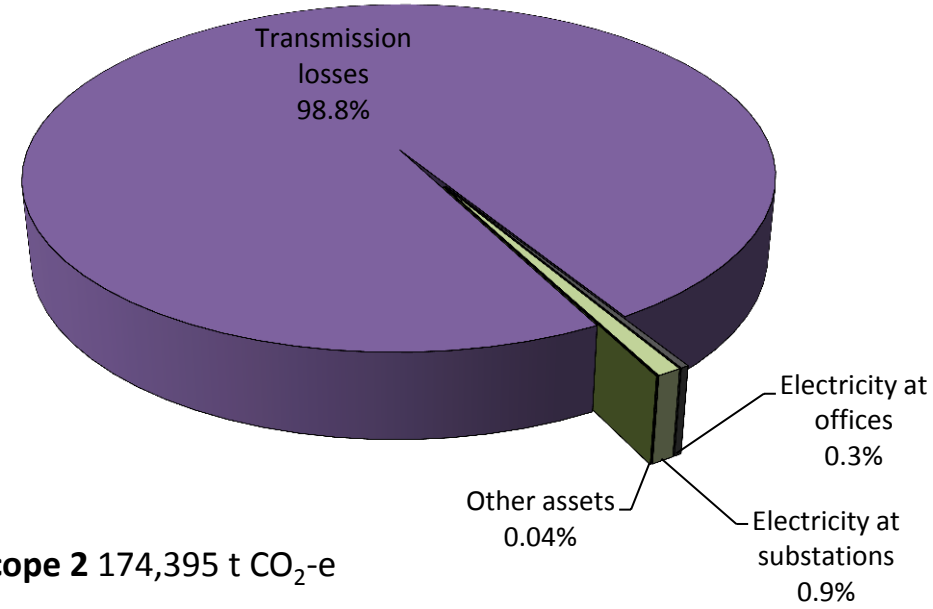


Figure 4 Operational greenhouse gas emissions by scope (excluding transmission losses)

2.3 By activity within each scope

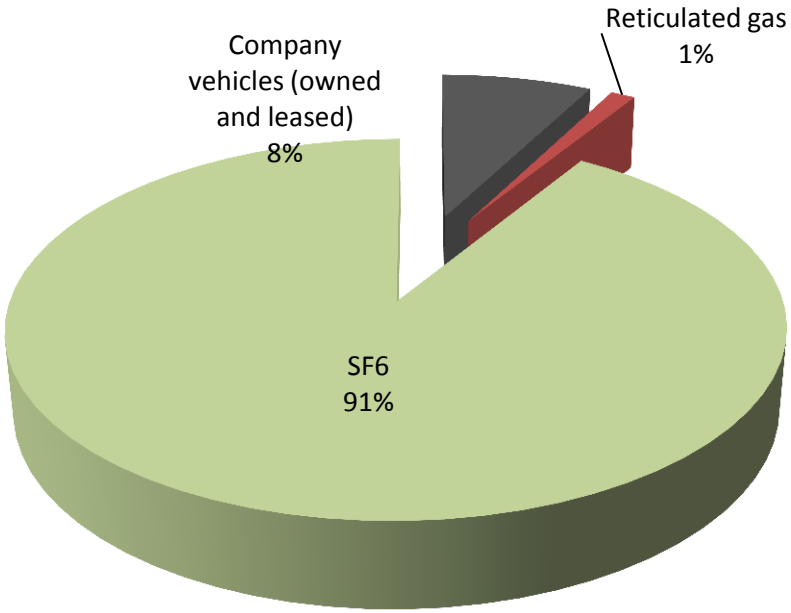
Figure 5 to 8 show emissions from individual processes and activities within each scope. SF_6 is clearly the main contributor within Scope 1, while fuel consumption by our fleet is the next largest

contributor. Electricity from transmission losses dominates Scope 2 emissions (



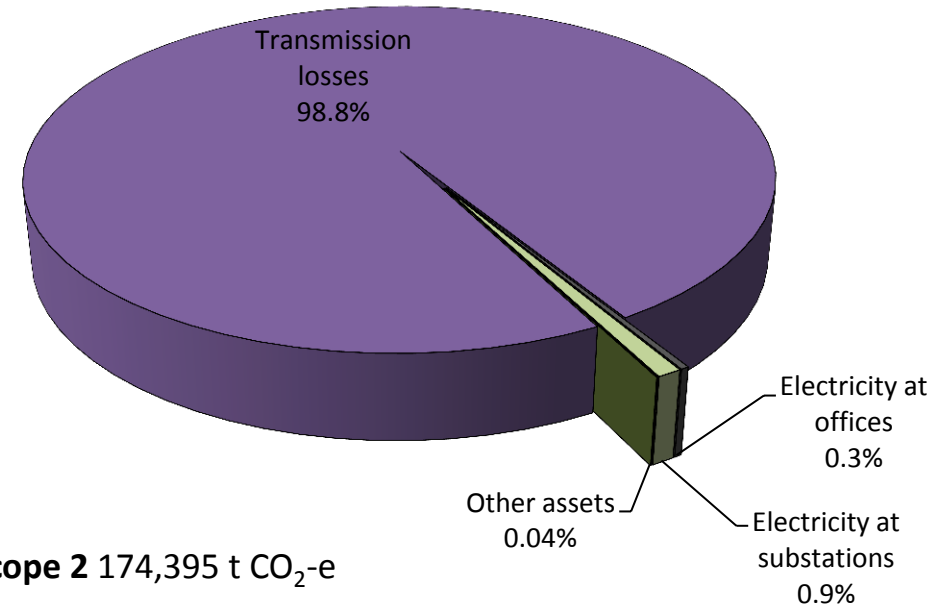
Scope 2 174,395 t CO_2-e

Figure 6). When reporting on operational emissions only (i.e. excluding transmission losses), emissions from electricity consumed at substations are the largest contributor of Scope 2 emissions, consuming more than three times the amount of electricity than all of our offices combined (Figure 7). In terms of Scope 3 (Figure 8), staff air travel is the main contributor (75%). Line losses are those associated with our electricity and gas use.



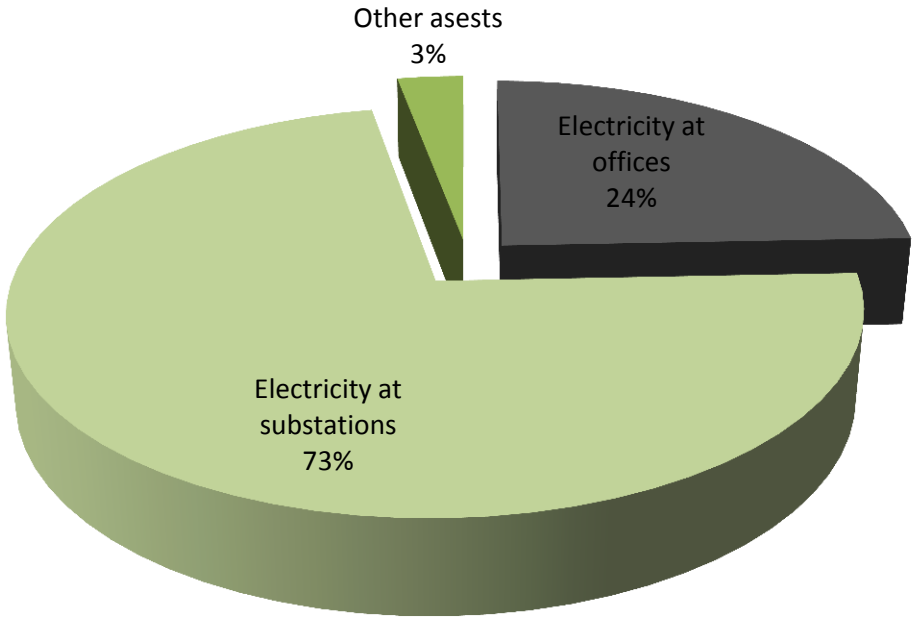
Scope 1 5,648 t CO_2-e

Figure 5 Greenhouse gas emission sources Scope 1



Scope 2 174,395 t CO_2-e

Figure 6 Greenhouse gas emission sources Scope 2



Scope 2: 2,157 t CO_2-e

Figure 7 Greenhouse gas emission sources Scope 2 (operational, excluding transmission losses)

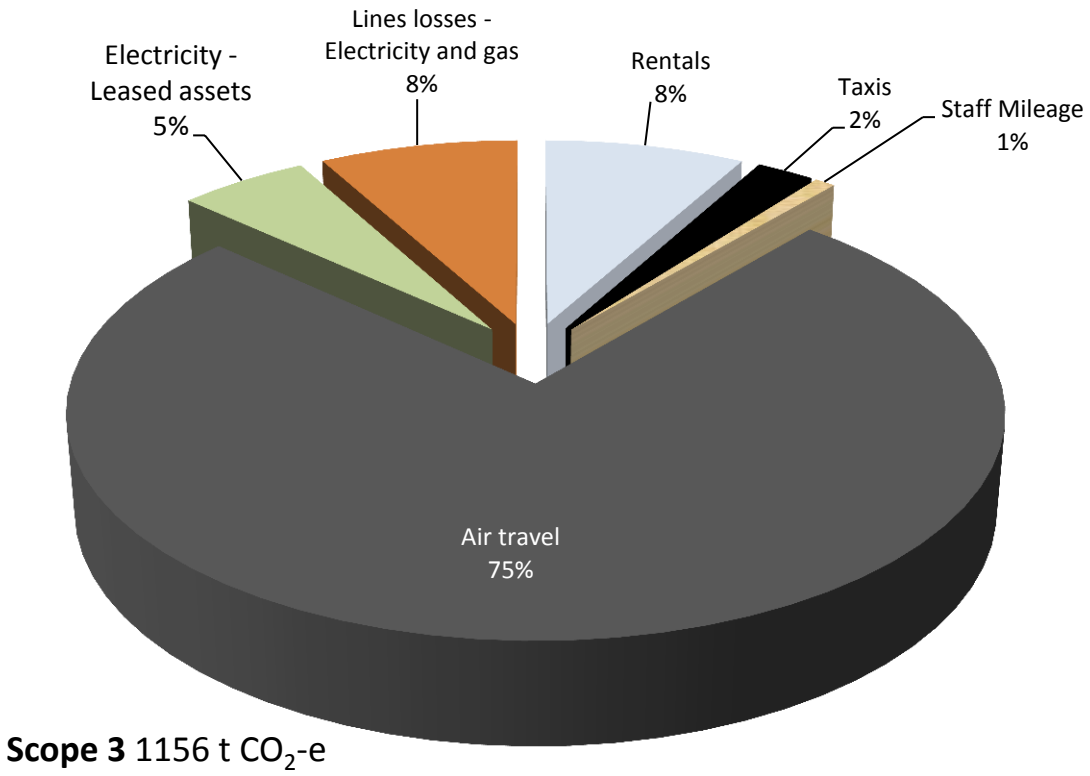


Figure 8 Greenhouse gas emission sources Scope 3

3. Comparison to previous years

3.1 All emission sources

Figure 9 shows our carbon footprint since the baseline year (2005/06), both as total emissions (blue bars) and expressed on a per FTE basis (red line). The increase between 2009/10 and 2011/12 was largely due to work on major grid enhancements resulting in increases in three activities: diesel consumed by the staff fleet, domestic flights and international flights.

The trend reversed in 2012/13 with decreases across all major emission sources. This downward trend continued into 2014/15. In 2015/2016, there has been an increase of 12%, predominantly due to increases in SF_6 emissions.

The carbon footprint per full-time equivalent staff member (FTE) provides a measure of total emissions against staff numbers. While this figure has varied over the years since we began measuring, this year's emissions are 31% below the baseline year.

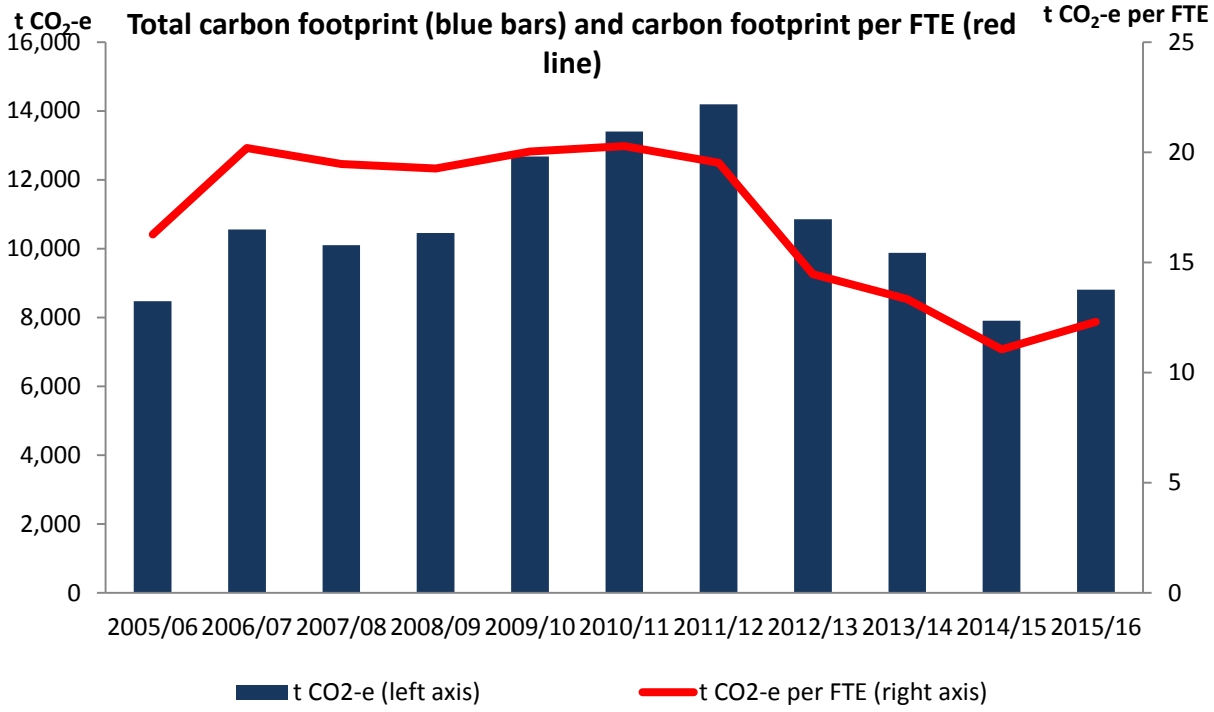


Figure 9 Total carbon footprint (blue bars) and carbon footprint per FTE (red line)

Table 1 illustrates the annual emissions trends for a range of activities. Compared to 2014/15, electricity consumption shows the greatest emission reduction (-11%); this is predominantly due to a 23% reduction in emissions from electricity consumption in our regional offices. The largest increase was for SF_6 emissions and rental vehicles, which both increased by 32% compared to 2014/15.

Table 1 Changes in emission quantities compared to 2011/12 – 2014/15

Emissions by Type	2011/12	2012/13	2013/14	2014/15	2015/16
Fuels for TP vehicles	10%	-35%	-56%	-27%	-5%
Rental vehicles	-27%	61%	-28%	-30%	32%
Taxis	-4%	-4%	-27%	-29%	15%
TP air travel	6%	-23%	-27%	-19%	-1.3%
Electricity	28%	-3%	-6%	2%	-11%
Transmission Loss	12%	3%	-13%	-2%	-0.1%
SF_6	1%	-21%	-5%	-23%	32%
Total operational emissions (excl. transmission loss)	**11%**	**-24%**	**-38%**	**-16%**	**12%**
Total emissions	**11.6%**	**0.3%**	**-15.2%**	**-3.0%**	**0.45%**

Increase (<5%)	Constant (+/-5%)	Reduction (-5%)
5%	0%	-5%

3.2 SF_6 emissions

Emissions related to SF_6, a highly potent greenhouse gas, represent our highest operational emission source. Figure 10 shows changes in the SF_6 emission rate, as a percentage increase of total SF_6 inventory. The emission rate (% loss of SF_6 inventory) this year was 0.5%. The trend line illustrates a consistent downward trend since 2006/07 despite the 2015/16 increase. SF_6 emissions in previous years reaped the benefits of investment in leak reduction initiatives including training, leak detection and new filling equipment.

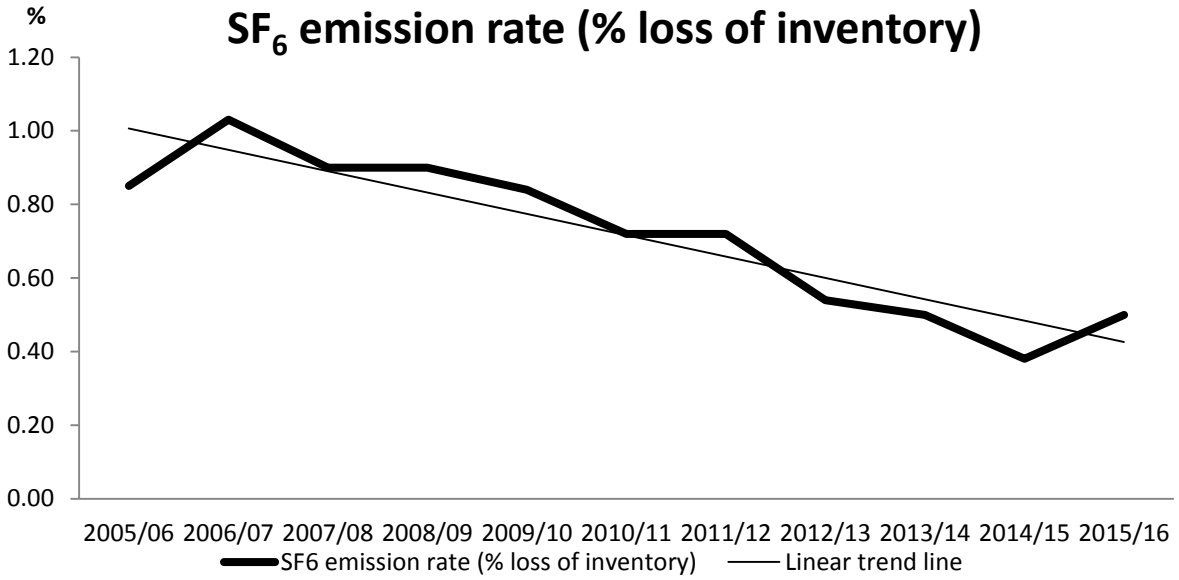


Figure 10 SF_6 emission rate as a percentage loss of SF_6 inventory

In terms of target setting, we have a primary goal of reducing emissions to below 0.8% of the total SF_6 held in stock. This was achieved in 2007/08 and has been maintained since. In 2015/16 emissions from SF_6 loss are equivalent to 0.5% of the total SF_6 held in stock. This represents a 32% increase compared to the SF_6 loss reported in the previous year.

3.3 Staff fleet emissions

Figure 11 shows the carbon footprint of our staff fleet per FTE (blue bars) and the percentage contribution of this activity towards our total carbon footprint (red line).

A significant increase was seen in 2010/11 and 2011/12, due to the large increase in the use of diesel powered machinery for various grid upgrade projects, such as the North Island Grid Upgrade Project (NIGUP), and the purchase of additional diesel fleet vehicles. In 2012/13 this trend was reversed and the emissions continue to decrease. In the last reporting year the emissions from corporate fleet vehicles have decreased by 5%. However, overall emissions associated with land transport increased by 12% mostly due to increase in use of rental cars and taxis.

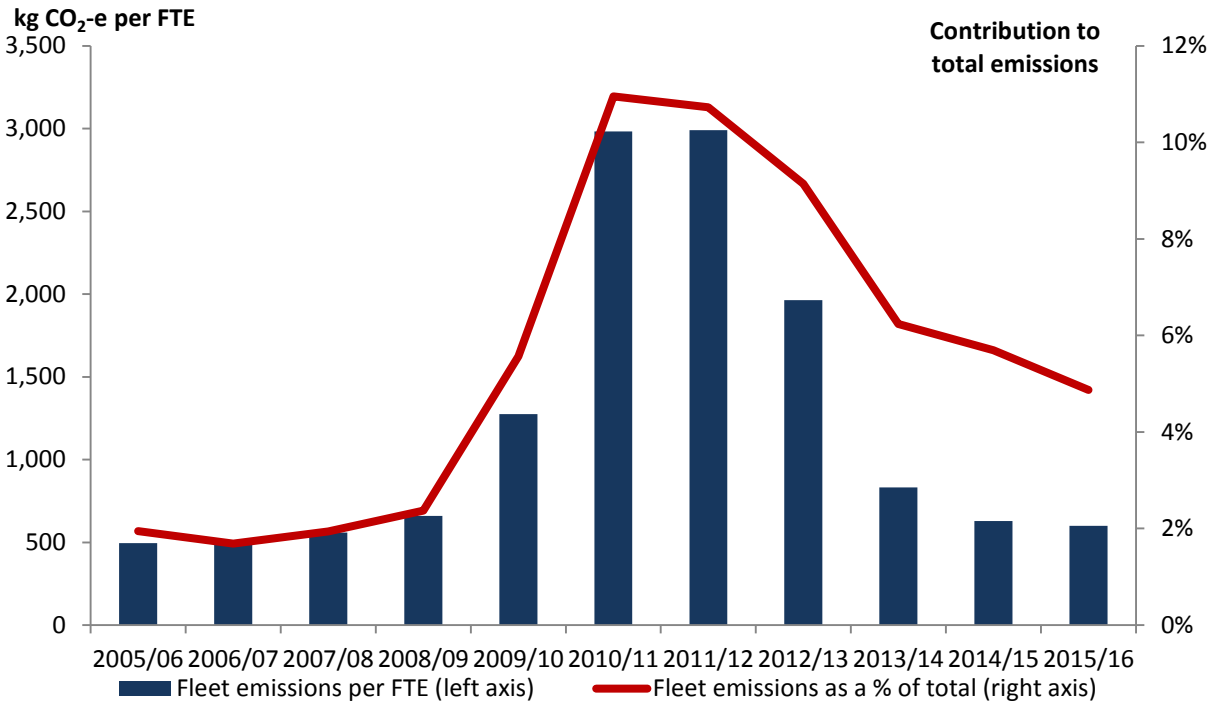


Figure 11 Staff fleet emissions over time

3.4 Air travel

Overall emissions associated with our air travel decreased by 1.3% compared to last year. However, this is short of the annual 10% reduction target. Figure 12 shows that distances travelled on long haul flights have increased by 27% since 2014/15. Domestic flights and Trans-Tasman flights have decreased by 6% and 5% respectively.

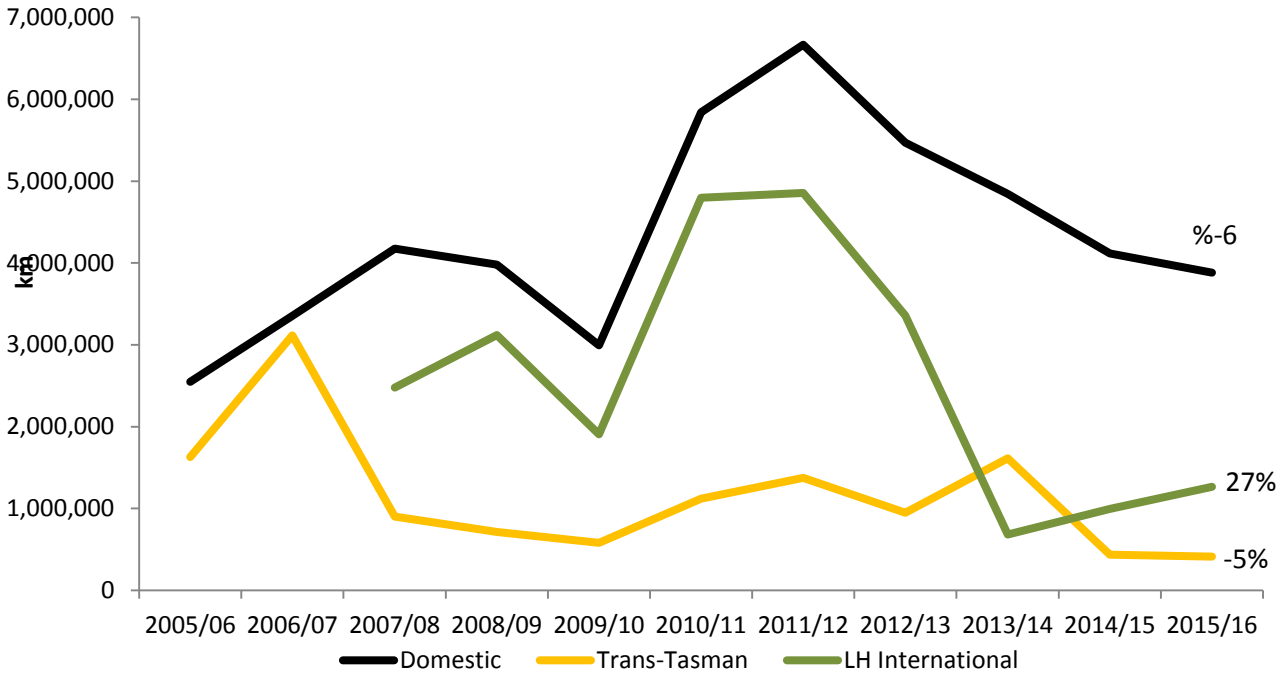


Figure 12 Air travel emissions for Transpower staff

3.5 Electricity consumption in offices

Electricity use (kWh) in our offices has decreased by 23% compared to last year (Figure 13). This is largely due to a reduction in the number of office spaces we occupy. Electricity consumption at the NCCN office in Hamilton and the Horsham Down Office have decreased the most significantly, 35% and 25% respectively. Miro Street has had the most significant increase of 116% since 2014/15.

Overall energy efficiency of our offices (kWh per m^2 and kWh per FTE) has improved by about 23% (Figure 14). However, both the Genesis Building and the Christchurch Regional Office have increased their energy consumption (by 37% and 15% respectively) despite decreasing in floor size.

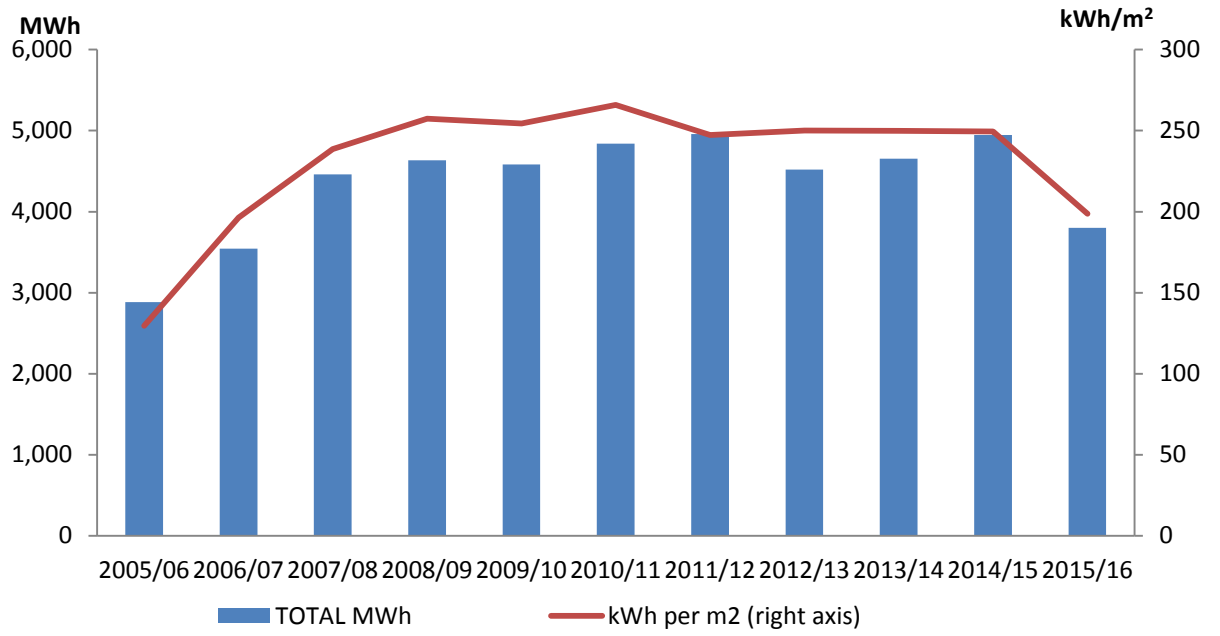


Figure 13 Electricity consumed in our offices per m²

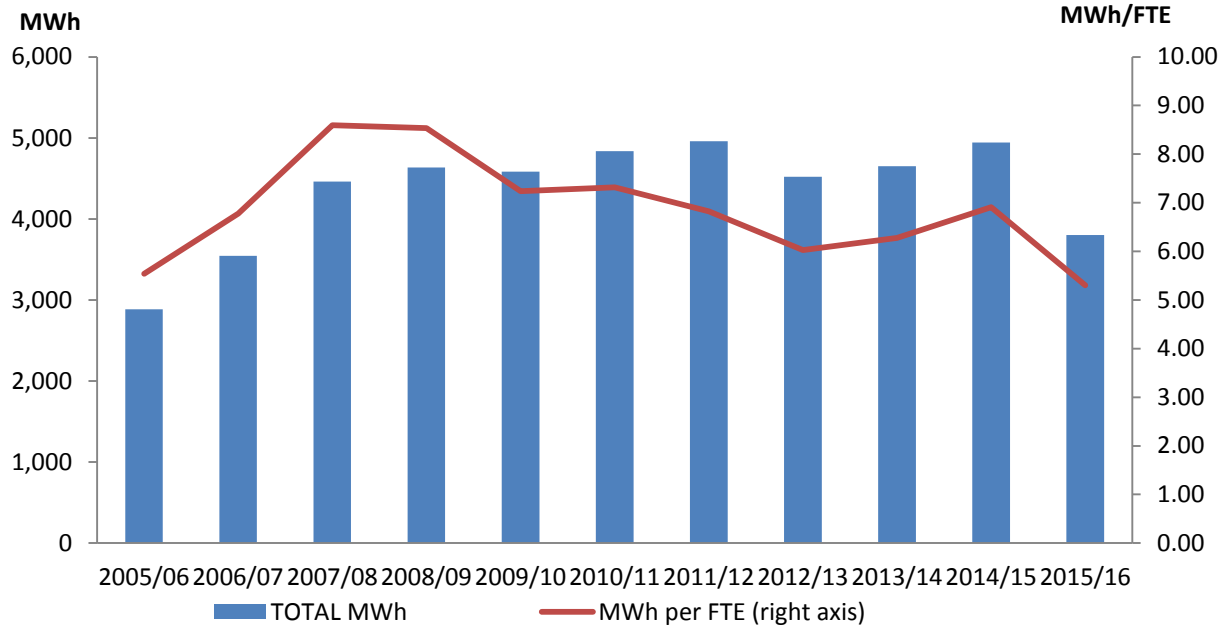


Figure 14 Electricity consumed in our offices per FTE.

4. Emissions measured against transmission and capex

Figure 15 shows two greenhouse gas intensity measures relevant to our operations: the quantity of electricity transmitted and capital expenditure[1]. In terms of emissions per GWh transmitted (blue line), this measure increased by 3% since last year, interrupting a downward trend which had been occurring since 2011/12.

Intensity related to capital expenditure (red line) increased by 75% compared to last year. This is due to a 36% reduction in CAPEX, while the total emissions (excluding overall transmission losses in our network) increased by 12%.

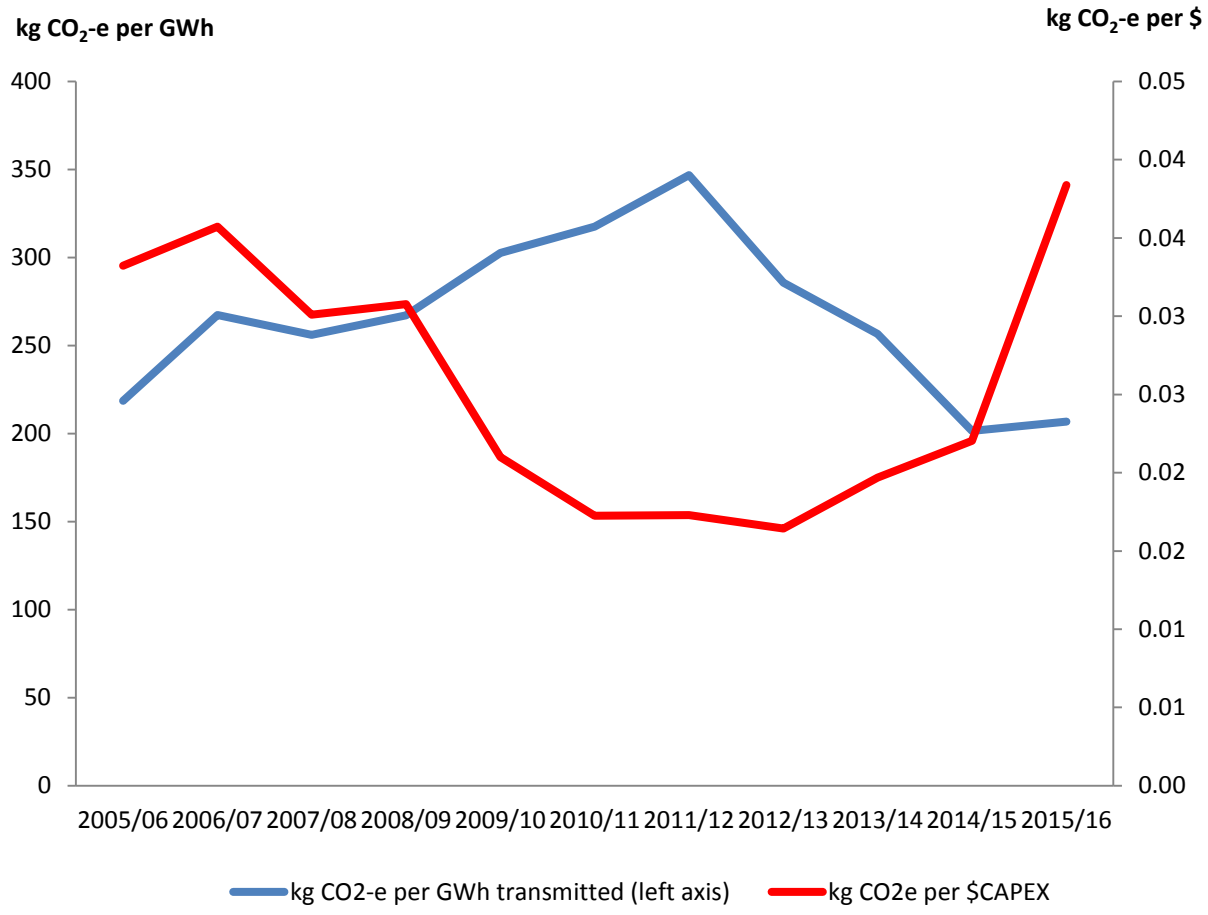


Figure 15 Transpower's carbon intensity

[1] Our overall emissions are heavily influenced by the emissions associated with electricity generation. Emissions vary significantly between a wet year with abundant hydro power to a dry year with more emissions from coal, masking any changes in our operational efficiency. To capture changes in our operation, emissions reported here exclude emissions from transmission losses.

5. Transmission losses

The Greenhouse Gas Protocol requires that "*emissions from the generation of purchased electricity that are consumed during transmission and distribution are reported in Scope 2 by the company that owns or controls the T&D operation"*.

The GHG Protocol defines purchased electricity as: *electricity purchased or otherwise brought into the organisational boundary of the company*.

On a request for further guidance on the interpretation of the GHG Protocol, the World Resources Institute (the developer of the Protocol) confirmed that electricity lost in transmission in owned and operated systems is regarded to be electricity consumed by the network operator and needs to be included in Scope 2.

As a result, even though we do not purchase any of the electricity that is transmitted through our network, emissions associated with transmission loss are included in the Scope 2 emissions. Emissions reported for previous years have been re-calculated to account for the change in the reporting boundary.

Addendum

This document is a summary report only. This report should be read in conjunction with the methodology disclosures in the Carbon Calculator 2015-16 final excel spreadsheet – particularly the Introduction and the Boundary sections.