07

ENVIRONMENT
Measure. Manage. Commit.

Our Approach

SingTel is committed to understanding, managing and minimising the environmental impact of our business and operations. We achieve this through energy efficient practices and technologies, resource conservation and pollution prevention. We focus on four key environmental aspects: energy and water use, carbon emissions and hazardous and non-hazardous waste management.

Our Environmental Management System (EMS) provides guidance on the management of these key environmental aspects in the course of our daily operational activities.

This system ensures compliance with all applicable environmental regulations in Singapore. This is by no means a static endeavour as legislation changes and the breadth of our activities has increased steadily over the past few years.

Working on reducing our environmental footprint requires rigorous planning. Where possible, we have introduced and adopted best practices, and will continue to do so.

Initiatives in FY2013 included:

- Conducting a study on our employees' commuting patterns and including this in our Scope 3 carbon footprint calculation
- Performing energy audits, completing a total of eight at various SingTel premises in Singapore
- Installing new energy efficient mobile base stations
- Overhauling seven chillers under our optimisation and energy efficiency programme
- Purchasing an electric vehicle as part of a test-bed initiative by the Land Transport Authority and Energy Market Authority
- Completing a successful trial of a Performance Enhancement Lighting Management System (PELMS) at one of our exchanges
- Promoting awareness on environmental conservation and protection through our annual Project LESS campaign (see Chapter 8 on Community)

In FY2013, we conducted a review of our EMS in an effort to align it to the ISO14001:2004 international standards for environmental management systems and to ensure its relevance, adequacy and effectiveness.

MANAGE WASTE AND HAZARDOUS MATERIALS RESPONSIBLY

As one of the largest companies in Singapore, SingTel aims to lead by example in managing our waste responsibly. Waste management is a major issue for Singapore due to the lack of available physical space, so we need to be especially mindful to reduce the amount of waste we generate in the 1st place.

The core of our strategy for waste management lies in creating awareness. Firstly, creating an awareness of the major initiatives within SingTel and the links between company targets and individual employee actions and secondly, awareness that small, everyday actions can have much larger collective impact.

Some examples of new initiatives and investments we have made are related to digital projects, aimed at cutting down on resource use such as paper, storage and travel, as well as the utilisation of physical space:

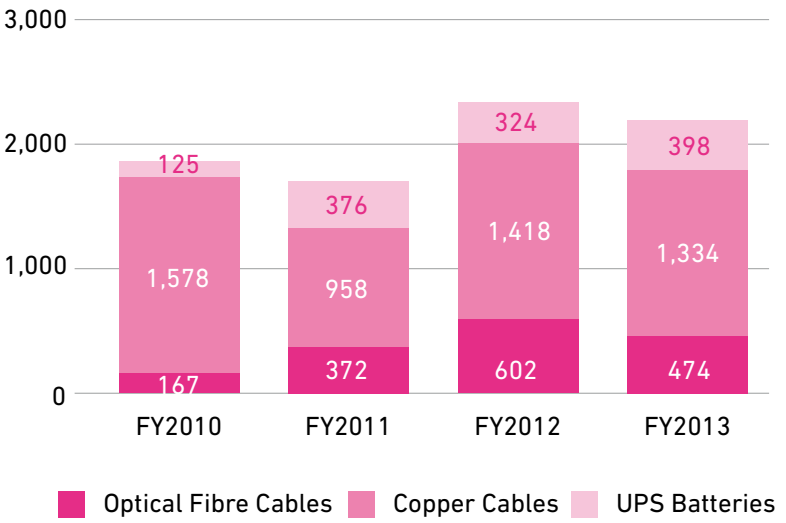
- Implementation of a site-level manual tracking system for non-hazardous waste
- Commenced implementation of managed printing networks to reduce waste by holding print jobs until the user 'taps' the staff access card on the network printer
- The continuation of 'Learn-on-the-Go', an e-learning / m-learning platform that promotes and expands the virtual classroom and learning opportunities for employees
- Board meetings are paperless as Directors are provided with tablet devices to read Board papers prior to and during meetings

Hazardous and non-hazardous waste

A key aspect of our EMS is the responsible disposal of waste materials generated from our operations. We continue to monitor our waste and track targets to assess the types and levels of materials used and disposed of. We ensure that registered and licensed waste management companies are engaged to dispose of all hazardous electrical and electronic component waste as well as inflammable fuels.

We report on three main categories of hazardous waste. There was a 6% decline in the disposal of scrap copper cables from 1,418 tonnes in FY2012 to 1,334 tonnes in FY2013, and a fall in scrap optical fibre cables, down 21% from 602 tonnes to 474 tonnes in the same period due to the completion of the NBN fibre rollout. The disposal of lead acid batteries increased by 23% to 398 tonnes due to a phasing out and replacement programme.

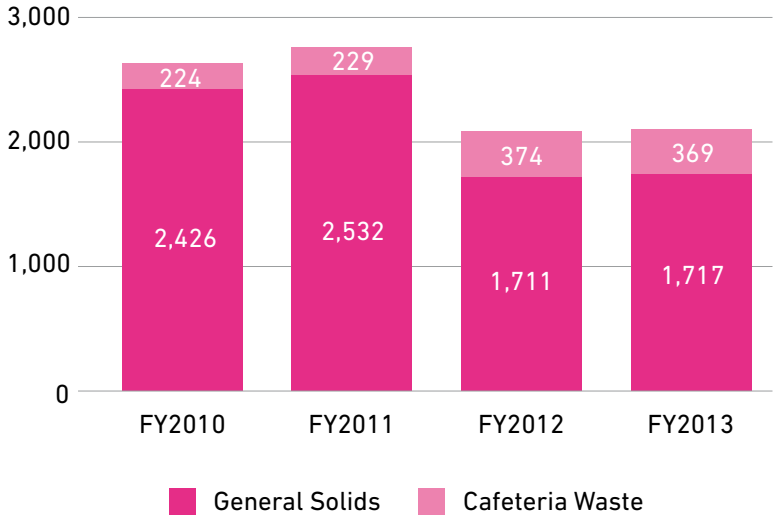
Hazardous Waste Generation (tonnes)



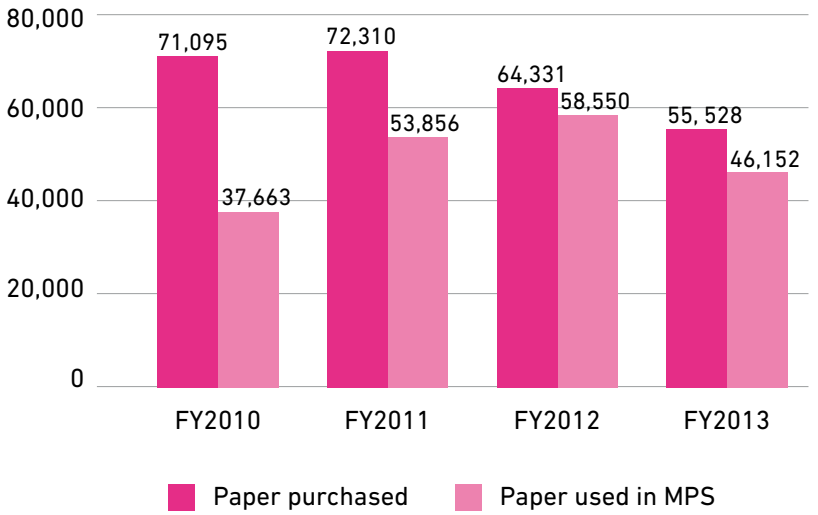
The main categories for non-hazardous waste are general solids (or daily rubbish) and cafeteria waste. In FY2013, both types broadly generated the same amount of waste as the previous year. General waste increased slightly by 0.3% to 1,717 tonnes while cafeteria waste was marginally lower by about 1% at 369 tonnes. Our biggest staff cafeteria at our headquarters at Comcentre serves our staff and members of the public.

We monitor paper usage by tracking the amount purchased in addition to consumption via the Managed Printing System (MPS). The MPS uses 'Tap Printing' which reduces unnecessary waste by holding print jobs until users tap their staff access cards on the network printer. Purchase of paper reduced by 14% and paper usage on MPS declined by 21%. We have also converted all purchase of white photocopying paper to Forest Stewardship Council or FSC-certified paper since September 2012. We use 100% recycled paper for SingTel-branded bags at our retail shops and biodegradable plastic bags for mobile phones trade-in.

Non-Hazardous Waste Generation (tonnes)



Paper purchased vs Paper consumed via MPS (reams)



Waste recycling

In FY2012, we recycled 24% of our total waste. This includes recycling nearly 45% of our hazardous waste, mainly through recycling scrap copper cables. We continue our recycling efforts at our premises across Singapore and aim to further increase our level of recycling.

SingTel was the 1st mobile phone operator in Singapore to provide customers with the facility to recycle their mobile phones. Together with our partner Nokia, we have been encouraging our customers to reduce waste and recycle and making it as easy as possible for them to do so. Since the programme was launched in March 2011, we have collected more than 2,000 mobile phones.

MANAGE EFFICIENT ENERGY CONSUMPTION

In a country lacking natural resources, energy efficiency has become a strategic priority for Singapore. For this reason, a regulatory focus led to the Energy Conservation Act of 2012 which came into force in 2013. Although the legislation is not applicable to SingTel, we measure, manage and report on our energy use, and continue to focus on improving our energy management through the implementation of various efficiency initiatives.

Energy conservation

SingTel pledged to cumulatively save 32.7 GWh of electricity from energy conservation initiatives implemented in FY2010 over the period FY2011 to FY2013.

A range of energy efficiency and management measures has been introduced, including a programme of energy audits, optimisation, replacement and overhaul of chillers and lighting systems. We also leverage our environmental campaign Project LESS (Little Eco StepS) to raise staff awareness.

To date, SingTel has achieved cumulative electricity savings of 59.6 GWh far exceeding the target set in FY2010. Additional savings of 6.3 GWh was achieved from projects commissioned and completed in FY2013. This is equivalent to 1.8% of our total energy consumption for the year and translates into a reduction of our carbon footprint by 3,226 tCO_2e emissions. Moving forward, we will roll out a new set of five-year energy conservation programme and set new energy reduction targets.

In line with our targets for FY2013, eight audits were conducted at exchanges in Singapore: Central, Changi, Hougang, Jurong East, Katong, North, Queenstown and Telok Blangah Telephone Exchanges. The results gave us a good understanding of the operations at each of our exchanges and will provide a basis for planning improvements moving ahead. Since the beginning of our programme in 2006, energy audits have been conducted at all of our office premises and 22 network exchanges.

Energy efficiency and management

Chiller optimisation and overhaul

Chiller plant optimisation seeks to optimise the entire air-conditioning operation of a building in real-time by controlling every major component of the air-conditioning system to respond to changes in the ambient environment and space cooling demand. By responding to real-time ambient conditions, over-cooling is avoided thus saving energy.

The optimisation of the chiller plant at the Serangoon North building was completed in October 2012. The reduction in annual electricity consumption is estimated to be 324,000 kWh, equivalent to 167 tCO_2e, with an investment payback of 21 months.

Chiller efficiency is another focus area as each chiller's performance deteriorates over time. Notwithstanding routine maintenance, a mid-life overhaul can bring a chiller closer to its operating design efficiency.

We commenced the overhaul of 10 chillers during the year, completing seven by end of FY2013 with the remaining three targeted for completion by May 2013. Upon completion of this initiative, the total energy savings is estimated to be more than 880,000 kWh per year, equivalent to 455 tCO_2e. The payback period for each chiller is 25 months.

Performance Enhancement Lighting Management System (PELMS)

In 2012, SingTel conducted a trial of the Performance Enhancement Lighting Management System (PELMS) at the 2nd level of Telok Blangah Exchange. This included corridors, the Main Distribution Frame (MDF) room and equipment rooms. PELMS allows the lighting level to be automatically managed based on detection technology to assess the presence or absence of people. The average energy savings achieved was around 45%.

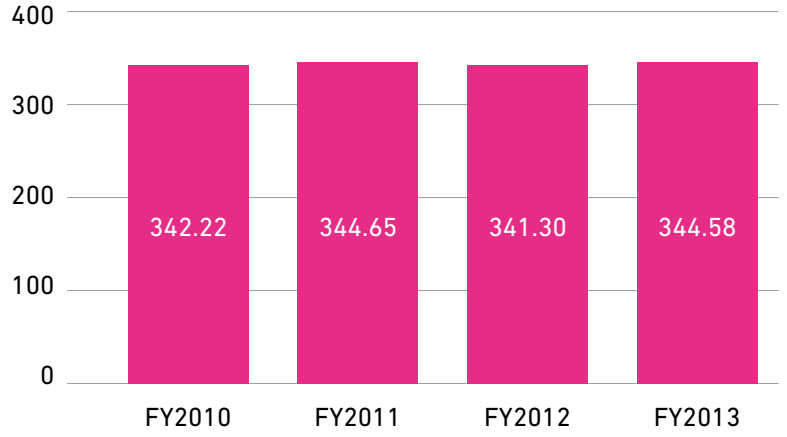
PELMS is being extended to the remaining areas within the exchange. The estimated energy savings of 128,910 kWh per annum, equivalent to 66 tCO_2e, has a payback period of just over 16 months. The reduction is about 4% of Telok Blangah Exchange's annual energy consumption.

Indirect energy use

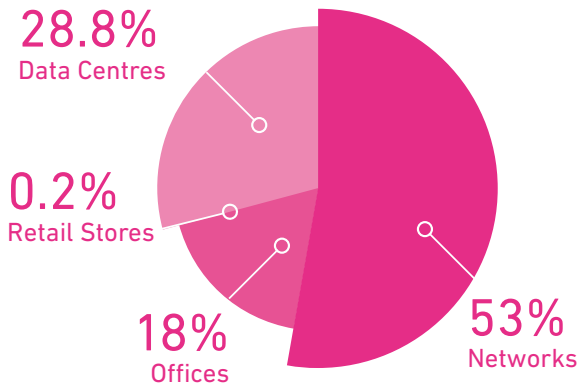
SingTel's indirect energy usage includes all of our owned premises, rented offices, mobile base stations and MDF rooms. Overall, SingTel consumed 344.58 GWh in FY2013, a marginal increase compared to 341.30 GWh in FY2012. This slight increase is mainly due to the installation of more mobile base stations to support the growing needs of our customers. However, the energy consumption did not increase correspondingly due to the installation of more energy efficient mobile base stations (see story below).

For the 2nd year, we have provided information on energy usage by operation. The majority of our usage comes from networks[1], accounting for 53% of the total electricity use. The distribution of energy has been constant the past four years, with a slight decrease in percentage of energy use in offices and a corresponding increase in data centres and networks.

Energy Use (GWh)



Indirect Energy Use Distribution in FY2013



[1] Our network operations include telephone exchanges, main distribution frame rooms and mobile base stations.

Energy efficient mobile base stations

In an effort to reduce energy consumption via our networks, an initiative implemented in FY2013 was to upgrade our mobile base stations to the latest generation of 'green' base stations (Ericsson 6000 series).

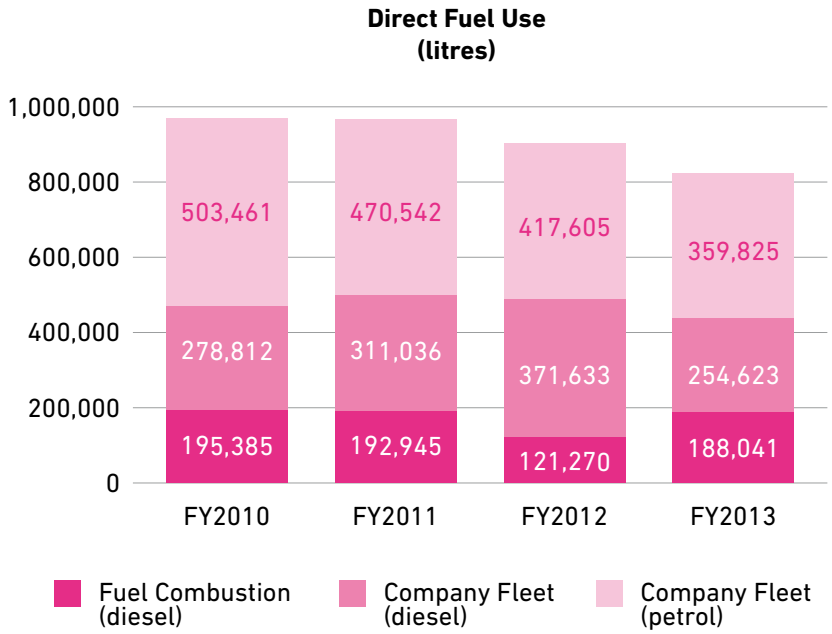
As at 31 March 2013, 87% of all our mobile base stations (new and upgraded) have been converted to more energy efficient ones. The remaining 13% are in the process of conversion.

Although total energy usage by mobile base stations increased slightly by 5 GWh to 38 GWh in FY2013, we achieved a 48% savings in energy use per cell carrier due to more energy efficient base stations.

Direct energy use

Direct energy use in Singapore, or our use of primary fuels, consists of petrol and diesel for our commercial vehicle fleet, and diesel for our backup power supply generator sets. Our total fuel use in FY2013 was 802,489 litres compared to 910,507 litres in the previous year (diesel: 442,664 litres and petrol: 359,825 litres). The significant decrease in fuel use was due to the transfer of 135 vans previously under our fleet to a 3rd party in June 2012 as part of a managed service project.

Under our vehicle replacement programme, one company-owned van was replaced with a Euro IV compliant model. To date, we have 111 Euro IV compliant vehicles, representing 28% of our fleet.



Renewable energy initiatives

Harnessing solar energy at Pasir Ris Telephone Exchange

The Grid-tied Solar Photovoltaic System at our Pasir Ris Telephone Exchange yielded 47,836 kWh in FY2013, which is equivalent to 25 tCO_2e.

Due to renovation works at the Bukit Timah Hill Radio Station, our solar panels were sheltered from sunlight, and therefore did not generate any supplement energy to the grid.

We will also be installing solar panels at Seletar Satellite Station and Pulau Ubin Base Station as part of our renewable energy initiatives. Expected to be completed by October 2014, the two projects are estimated to generate 86,000 kWh per year, which is equivalent to 44 tCO_2e.

Electric vehicles test-bed

In April 2013, SingTel supported a national initiative co-led by the Land Transport Authority and Energy Market Authority to test the use of electric vehicles in Singapore. Our electric vehicle is one of 72 such vehicles on the roads as part of this test-bed and we also installed a charging station at our Comcentre carpark which is open to the public. Being part of this pilot programme gives us the opportunity to evaluate the costs and benefits of converting our vehicles to electric ones.

REDUCE OUR IMPACT ON CLIMATE CHANGE AND GHG EMISSIONS

Emissions monitoring and reporting in Singapore continues to be voluntary, but there is high interest in this area from stakeholders, including investors, enterprises, customers and special interest groups. We will continue to monitor local and global developments and expectations relating to greenhouse gas (GHG) emissions. We will also periodically improve our systems to enhance the scope of reporting so that calculations are robust and meaningful.

Over the last three years, we have gradually expanded the scope of our carbon footprinting calculations and in FY2013, we undertook an exercise to estimate the impact of our employees' commute to and from their workplace. These figures have been included for the 1st time and this has widened the scope of our GHG emissions calculations.

The main source of our GHG emissions is Scope 2 electricity, purchased directly from the national power grid in Singapore. This is our main focus area when assessing and determining initiatives to reduce our carbon footprint. Our net overall carbon equivalent emissions from indirect energy are 177,296 tCO_2e. Despite the energy conservation programmes undertaken in FY2013, our emissions have increased slightly by 1,698 tCO_2e, about 1% from the previous year. This marginal increase is due to the installation of more mobile base stations during the year.

SingTel's Scope 1 GHG emissions are derived from a combination of refrigerant gases used in air-conditioning systems and direct fuel use. The Scope 1 emissions in FY2013 were 6,897 tCO_2e. This is an increase of 3.9% or 256 tCO_2e over and above the total for FY2012. This increase is mainly due to the change-out of existing R11 and R134 refrigerants.

Following an extensive study of our employees commuting methods, our Scope 3 GHG emissions have expanded this year with their inclusion in the calculations. Air travel, at 2,352 tCO_2e remained the biggest element of Scope 3 emissions, but fell 712 tCO_2e, or 23% in the last year. This was due to our continued use of technology to minimise the need for business air travel coupled with a 22% drop in long haul flights taken during the year. The emissions figures for staff commuting added 1,821 tCO_2e to the overall calculation in FY2013.

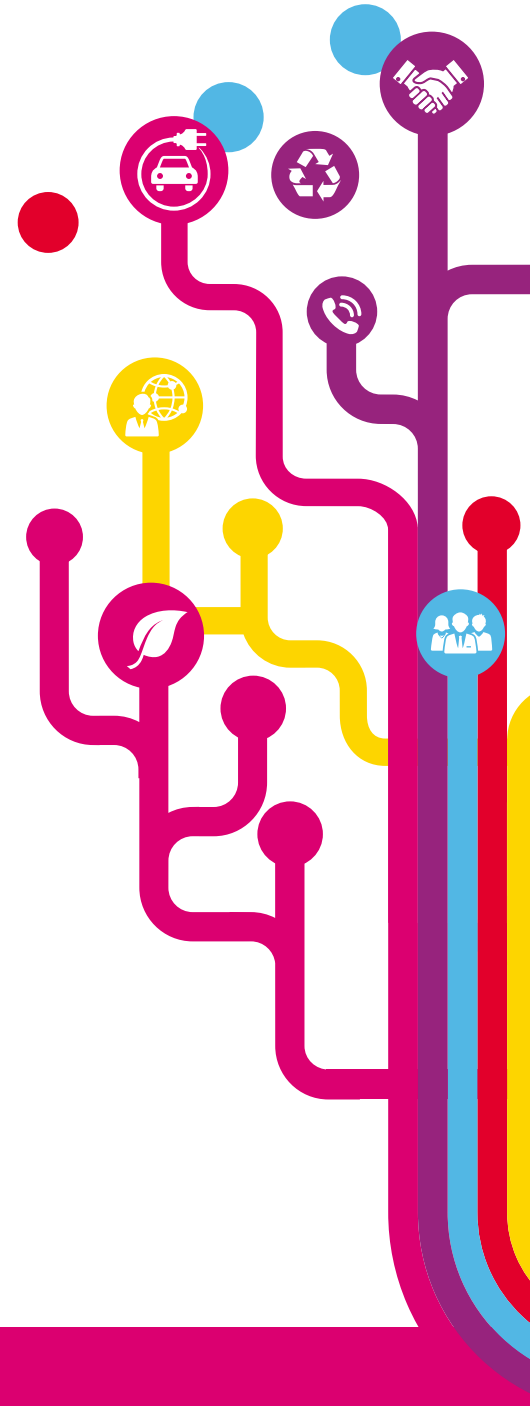
The full extent of aspects included in emissions calculation is shown in the table below.

Equivalent CO_2 Emissions generated by SingTel[2]

tCO_2e	FY2010	FY2011	FY2012	FY2013
Scope 1 (direct)				
Refrigerant gases	1,501	4,364	4,354	4,878
Fuel combustion - diesel	529	516	324	502
Company fleet - diesel	755	831	993	680
Company fleet - petrol	1,314	1,093	970	836
Total Scope 1 emissions	**4,099**	**6,803**	**6,641**	**6,897**
Scope 2 (indirect)				
Purchased electricity	**172,547**	**177,635**	**175,634**	**177,321**
LESS				
Renewable energy	(25)	(23)	(36)	(25)
Total Scope 2 emissions (net)	**172,522**	**177,611[3]**	**175,598[3]**	**177,296**
Scope 3 (other indirect)				
Contractor fleet - diesel	705	711	671	644
Contractor fleet - petrol	115	134	132	97
Air travel	3,021	2,628	3,064	2,352
Employee commute	NA	NA	NA	1,821
Total Scope 3 emissions	**3,841**	**3,473**	**3,866**	**4,914**
Total tCO_2e emissions (net)	**180,462**	**187,887**	**186,105**	**189,107**

[2] The equivalent CO_2 emissions for electricity use are calculated based on the updated simple operating margin grid emission factors from the National Environment Agency in Singapore for the relevant time period. Scope 1 direct emissions are calculated using the 2010 Guidelines to DEFRA/DECC's GHG conversion factors for company reporting (Annex 1 and 5). Scope 3 other indirect emissions are calculated using the 2010 Guidelines to conversion factors for DEFRA/DECC's GHG company reporting (Annex 6 and 7).

[3] Amendment to Scope 2 net emissions: FY2011 – 177,611 tCO_2e (previously reported 177,570 tCO_2e) and FY2012 – 175,598 tCO_2e (previously reported 175,324 tCO_2e) due to an exclusion of one premise in FY2012.



Staff commute study

In an effort to provide a more comprehensive overview of our carbon footprint, we surveyed our employees based in Singapore for the 1st time in FY2013 to obtain information about their commuting habits and patterns.

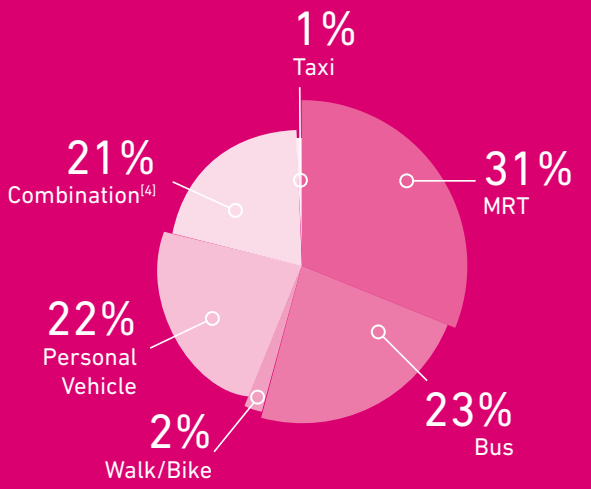
A good response rate of about 40% was achieved with over 4,600 qualified responses. We then extrapolated the results to get a representative carbon emission figure from SingTel's employee commute.

Although employee commute emissions of 1,821 tCO_2e represent less than 1% of our total carbon emissions, it contributes to almost 40% of our Scope 3 emissions.

This exercise will help us identify suitable initiatives to manage our Scope 3 emissions and allow us to engage our people on environmental and sustainability issues.

Moving forward, we will update our employee commute carbon emission figure only when there is a significant change in our company's operations.

Employee Commute Modes of Transportation



[4] Combination represents a mix of transportation modes.

CONSERVE AND MANAGE WATER USAGE

Water is a scarce and market-priced commodity in Singapore. SingTel uses two types of water: potable water which is drinking quality and NEWater, a high-grade reclaimed water used for operational activities such as cooling. Singapore's Public Utilities Board (PUB) supplies both and where possible, we seek to replace the use of potable water with NEWater for our operational activities. To conserve and protect this essential resource, we aim to reduce our consumption where it makes economic and environmental sense.

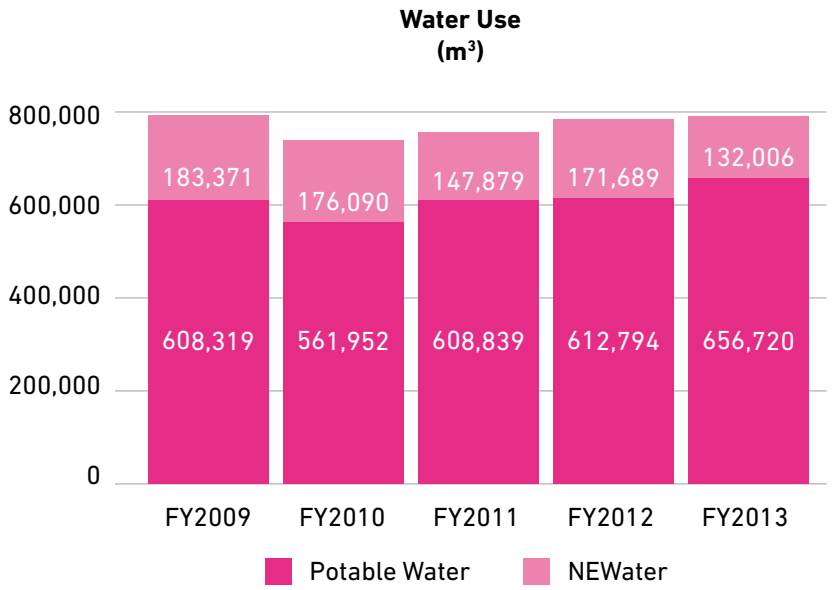
All our premises are certified under PUB's Water Efficient Building (WEB) programme. We have put in place processes for the early detection of water leakages and this includes daily water meter readings. The reporting scope for this report also includes our water usage at rented offices.

In FY2013, SingTel's total water consumption, a combination of potable and NEWater, increased marginally by 0.5% from last year to 788,726 m^3, despite our water conservation initiatives. Potable water increased by 7.2% and our use of NEWater decreased by 23% compared to FY2012. The drop in NEWater consumption was due to the replacement of chillers and a reduction in cooling needs due to relocation of data centre customers at Telepark.

The increase in potable water consumption is due to various reasons:

- A one-off replacement of hose reel tank at NCS Hub
- Faulty water tank pressure vessel and float valves in a number of cooling towers causing increased water consumption
- Increased coil and tube cleaning of water cooled packaged air-conditioning units to increase their efficiency

Without our water conservation measures that are already in place, these incidents would have had a more adverse impact. In an effort to monitor our water consumption more closely, we have installed additional individual water meters to all three blocks and cooling towers in NCS Hub. We believe that our continued monitoring and early warning processes will result in better performance in the coming years.



Biodiversity

During the current reporting period, we have not encountered any significant biodiversity issues.

SingTel acknowledges that biodiversity is a global concern and our main identified operations that could potentially pose a threat to biodiversity is cable laying and base station sites.

For these activities, we assess any potential environmental issues including impact on biodiversity from our network deployment. If any of our cable laying routes or base stations affects natural areas in Singapore, we consult with the National Parks Board and take their advice on how to proceed and minimise or eliminate any adverse impact. With undersea cable installations, minor localised seabed disturbance may not be avoidable although we do take into account, where possible, any adverse environmental impact to water quality and the natural environment.

Performance against sustainability goals

Key Areas of Focus	FY2013 Targets	FY2013 Performance
Manage wastes and hazardous materials responsibly	• Feasibility review on provision of recycling facilities for customers to return packaging materials	• In progress - the SingTel-Nokia Mobile Phone Recycling Programme will be extended to corporate customers in FY2014
	• Implement a manual tracking system for the disposal of general solids and cafeteria waste	• Completed - general solids and cafeteria waste are manually monitored and tracked at the relevant premises
Manage efficient energy consumption	• Target to save 49.6 GWh of electricity from energy conservation initiatives implemented in FY2010 over the period FY2011 to FY2013	• 59.6 GWh savings achieved from energy conservation programmes implemented since FY2010. We have met and exceeded the five-year target set to save 32.7 GWh by FY2015 and will set a new long-term target from FY2014
	• Energy audits at another eight sites to be conducted	• Energy audits at eight exchanges completed
	• Chiller replacement and overhaul programme to continue	• Commenced overhaul of 10 chillers. Expected completion by end-May 2013. Replaced two chillers and optimised one chiller plant. Replacement of three chillers in progress
Reduce impact on climate change and GHG emissions	• Review chiller replacement opportunities under the Carbon Footprint exercise	• Chiller replacement opportunities are reviewed annually and reported in the section above. Through the energy audits conducted, least efficient chillers will be identified and targeted for overhaul
Conserve and manage water usage	• Systematically monitor and promote efficient use of water	• Daily meter readings taken for early detection of leakage and unusually high consumption
	• NEWater capability to be provided at all new facilities where feasible	• In progress - waiting for new development of the NEWater network

Improvement targets

Key Areas of Focus	What We Will Do	
	Five-Year Plan (FY2011-FY2015)	**FY2014 Targets**
Manage wastes and hazardous materials responsibly	• Implement processes for reducing, recycling and re-using product packaging, either by encouraging our customers to return packaging materials and/or by using bio-degradable or recyclable materials	• To extend the SingTel-Nokia Mobile Phone Recycling Programme to corporate customers in FY2014
	• Develop a waste management system to track wastes from generation to disposal/recycling	• To review the current process of managing and tracking types of waste and disposal methods
Manage efficient energy consumption	• Target to save 32.7 GWh of electricity from energy conservation initiatives implemented in FY2010 over the period FY2011 to FY2013	• New energy conservation initiatives will be implemented over the next five years. Target to save 3.4 GWh of electricity from these initiatives in FY2014
	• Conduct energy audits for selected exchanges to analyse electricity consumption patterns so that power efficiency improvement programmes can be undertaken	• Energy audits have been conducted for all office premises and 22 network exchanges in Singapore since 2006. To review repeating the energy audit cycle in FY2014 • To replace four existing 800KVA UPS at data centres for improved efficiency and performance
	• Improve our chiller replacement and overhaul programme to further enhance cooling system efficiency	• Chiller replacement and overhaul programme to continue • To overhaul two chillers at Kim Chuan Telecommunications Complex 1
Reduce impact on climate change and GHG emissions	• Develop monitoring processes for benchmarking GHG emissions from business air travel	• Goal met in FY2012. We will review the possibility of expanding Scope 3 emissions to include our exclusive retailers' energy consumption in FY2014
	• Set goals for replacement of new chillers which is compliant with the Montreal Protocol	• To replace one R22-chiller each at Pickering Operation Complex and Paya Lebar Exchange
Conserve and manage water usage	• Continue to systematically monitor and promote efficient use of water	• Systematically monitor and promote efficient use of water
	• Provide for NEWater capability at new facilities	• NEWater capability to be provided at all new facilities where feasible