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ENVIRONMENT Measure. Manage. Commit.

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 4 key environmental aspects: energy and water use, carbon emissions and hazardous and non-hazardous waste management.

Our approach

We are committed to managing our environment footprint in the course of providing the best-in-class multimedia and ICT services to our customers. We want to minimise our environmental impact by actively understanding and managing our resource use and waste as our business expands and evolves rapidly.

Our Environmental Management System (EMS) supports our commitment to understanding and minimising our impact on the environment. It provides guidance on the management of key environmental aspects in the planning, design, construction and operation of our core network. In 2013, 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.

Our efforts towards environmental conservation were also recognised. For the 1st time, SingTel was listed on the CDP Asia (ex-Japan) 2013 Climate Disclosure Leadership Index, where CDP recognised SingTel for having the best disclosure score in the category of Best New Responding Companies.

Highlights

Inclusion of energy use from SingTel Exclusive Retailers (franchisees) in our Scope 3 GHG emissions reporting

2.2% reduction in energy intensity in FY2014 from FY2013

96% of our base stations (new and upgraded) have been converted to energy efficient ones

Listed on CDP Asia (ex-Japan) 2013 Climate Disclosure Leadership Index and recognised for best disclosure score in the category of Best New Responding Companies

Results for FY2014

Key Areas of Focus	FY2014 Targets	FY2014 Performance
Manage waste and hazardous materials responsibly	<ul style="list-style-type: none"> To extend the SingTel-Nokia Mobile Phone Recycling Programme to corporate customers in FY2014 To review the current process of managing and tracking types of waste and disposal methods 	<ul style="list-style-type: none"> • Completed • In progress – target for completion in FY2015
Manage efficient energy consumption	<ul style="list-style-type: none"> New energy conservation initiatives will be implemented over the next 5 years. Target to save 3.4 GWh of electricity from these initiatives in FY2014 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 4 existing 800KVA UPS at data centres for improved efficiency and performance Chiller replacement and overhaul programme to continue To overhaul 2 chillers at Kim Chuan Telecommunications Complex 1 	<ul style="list-style-type: none"> • In progress – 1.47GWh in electricity savings was achieved • In progress – we are currently implementing the recommended actions from previously completed energy audits. We will repeat the cycle after reviewing all recommendations for implementation • In progress – target for completion in FY2015 • Completed • In progress – target for completion in Q2 FY2015
Reduce our impact on climate change and GHG emissions	<ul style="list-style-type: none"> To review the possibility of expanding Scope 3 emissions to include our exclusive retailers' energy consumption To replace 1 R22-chiller each at Pickering Operation Complex and Paya Lebar Exchange 	<ul style="list-style-type: none"> • Completed • In progress – target for completion in Q3 FY2015
Conserve and manage water usage	<ul style="list-style-type: none"> Systematically monitor and promote efficient use of water NEWater capability to be provided at all new facilities where feasible 	<ul style="list-style-type: none"> • Completed • Not feasible to implement NEWater due to infrastructure constraints

Plans for FY2015

SingTel Environmental Strategy

SingTel is committed to a holistic and structured approach towards managing and minimising the environmental impact across our value chain.

In FY2014, we conducted an internal assessment to identify the potential environmental impact across our networks, building operations as well as retail and distribution business. We identified 3 strategic themes that will frame our environmental strategy going forward.

Climate change and energy use

- Reducing energy use and CO₂ emissions in our operations
- Enabling energy efficiency by helping our customers to reduce their CO₂ emissions through our products and services

Product stewardship

- Reducing our environmental impact across the lifecycle of our products and services

Waste management

- Responsible management of electronic, packaging and general waste

Employee engagement and awareness in environmental issues, strengthening our EMS and processes, as well as regulatory compliance will run parallel to these focus areas. We are in the process of setting up a governance structure comprising committees and working groups to facilitate our strategy implementation.

MANAGE EFFICIENT ENERGY CONSUMPTION

Much of the energy generation in the world today is through non-renewable resources. The growth in demand for mobile and ICT services has also resulted in an increase in energy consumption to operate our networks. Hence, it is important that we take active measures to be energy efficient and to reduce our environmental impact.

Our main focus is on managing energy use within our network infrastructure (which include telephone exchanges, mobile base stations and satellite earth stations), data centres and building operations. Our initiatives in FY2014 included:

- Overhauling 4 chillers and replacing 2 chillers under our optimisation and energy efficiency programme;
- Extension of the Performance Enhancement Lighting Management System to 7 telephone exchanges and 2 satellite earth stations; and
- Commissioning of 2 photovoltaic projects as part of our efforts to promote use of renewable and alternative energy.

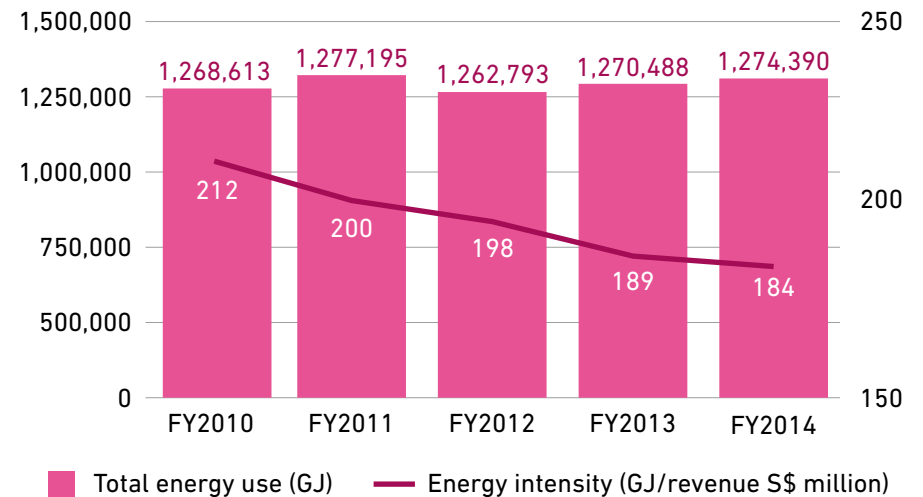
We also achieved Green Mark certification and PUB Water Efficiency Building Award for existing buildings at our Serangoon North office premise after a major retrofitting exercise.

Energy use

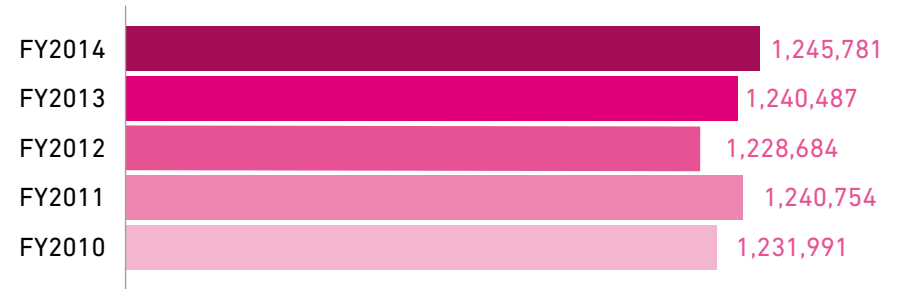
SingTel's total energy use and energy intensity in FY2014 were 1,274,390 GJ and 184 GJ/revenue (S\$ million) respectively. This includes electricity use by our network infrastructure, data centres and owned and rented premises, as well as non-renewable and renewable fuel consumed.

Electricity use represents 97% of our total energy use and has remained constant even though business has grown. Our overall electricity use in FY2014 was 1,245,781 GJ, an increase of 0.4% from the previous year. The increase is due to the installation of more mobile base stations in FY2014 to cater to our growing customer base and needs. However, this is mitigated by a reduction in electricity use across our office premises and data centres due to energy efficiency measures that we have put in place. We achieved an electricity intensity of 180 GJ/revenue (S\$ million), representing a decrease of 2.2% from the previous year.

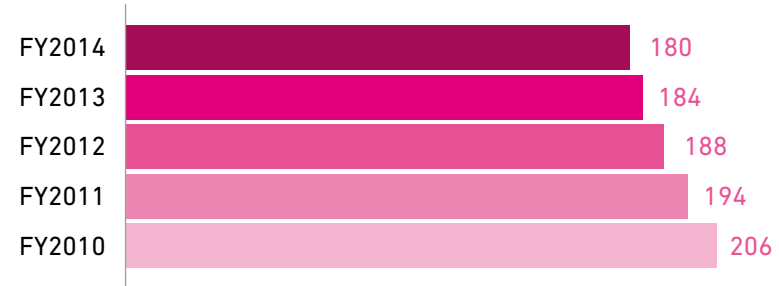
Total energy use and intensity



Electricity use (GJ)



Electricity intensity (GJ/revenue S\$ million)



Energy conservation

To date, SingTel has achieved cumulative electricity savings of over 300,000 GJ from energy conservation initiatives implemented since FY2010.

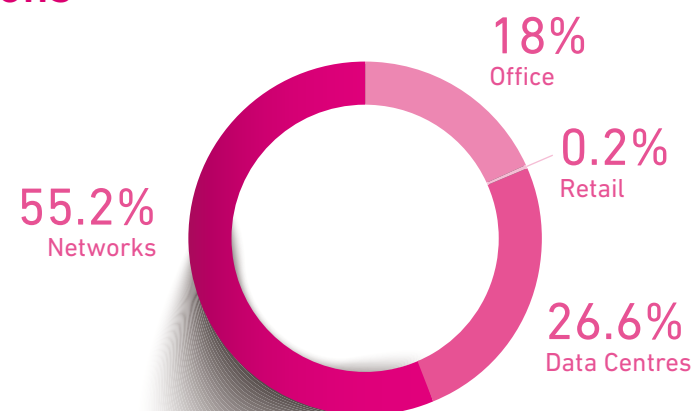
Energy efficiency in our networks and building operations

Energy use from our networks and building operations accounted for 55.2% and 18% of our total energy use in FY2014 respectively.

We continued to upgrade our mobile base stations to the latest generation of 'green' base stations. 96% of our base stations are now more energy efficient ones. While we doubled the number of mobile base stations installed during the year, we saw over 53% savings in energy use per cell carrier since FY2012.

With the successful completion of the Performance Enhancement Lighting Management System (PELMS) trial at Telok Blangah Telephone Exchange, we are extending the project to 7 other telephone exchanges and 2 satellite earth stations. Reductions in electricity use are estimated at 40% based on the trial results, potentially saving about 1,000 GJ per year. This is equivalent to 139 tCO₂e reduction in our carbon footprint.

Electricity use breakdown FY2014



Optimising our chillers

Chillers consume a large amount of energy and we therefore monitor them very closely. We recognise a need to overhaul mid-life chillers and revert their operating efficiency to their respective design value.

4 chillers were overhauled during the year, resulting in energy savings of 2,340 GJ. This is equivalent to a reduction of 323 tCO₂e.

We have also continued the cyclical replacement of aging chillers, targeting those that have been in operation for 15 years or more. In FY2014, 2 units of 400RT chillers were replaced with energy efficient ones. The efficiency of the new system is designed at 0.77KW/RT, resulting in an improvement of 14% in electricity consumption compared to existing units. A reduction of 1,254 GJ was achieved, with a carbon footprint reduction of 173 tCO₂e.

We plan to replace 5 more units of chillers located at 2 telephone exchanges in FY2015. This project will yield an estimated reduction of 1,500 GJ annually, translating to a further reduction in carbon footprint by 209 tCO₂e per year.

Renewable energy

Singapore's geographical location makes solar photovoltaic technology a promising option as a source of renewable energy due to an average annual solar irradiation of 1,150 kWh/kWp/year and about 50% more solar radiation than temperate countries^[1]. We constantly explore opportunities to utilise solar energy for our operations to reduce our reliance on fossil fuels.

As a result of the successful completion of a solar panel feasibility study at Seletar Satellite Earth Station in 2012, we will commission another 2 photovoltaic projects at Pulau Ubin Microwave Station and Seletar Satellite Earth Station (SSES). Both projects are estimated to be completed by end-2014.

In 2009, we piloted a Grid-Tied Solar Photovoltaic System at Pasir Ris Telephone Exchange where 192 photovoltaic panels were installed on the roof to support our power consumption for computers and the building's lighting system. In 2011, we commissioned a renewable energy system at the Bukit Timah Hill Radio Station comprising 100 pieces of solar panels and 3 wind turbines to supplement energy from the national power grid.

[1] Source: <http://www.ema.gov.sg/page/32/id:65/>



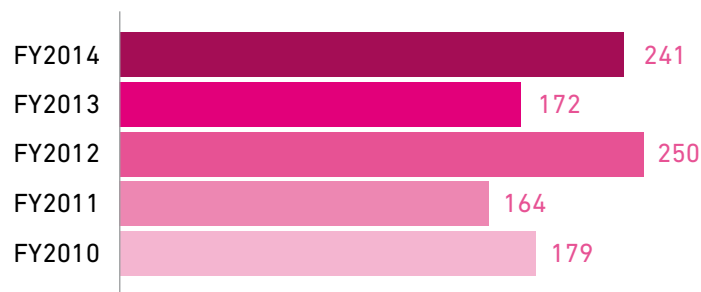
Switching to cleaner energy

In 2013, the Energy Market Authority embarked on a Pulau Ubin micro-grid test bed to assess the reliability of electricity supply within a micro-grid infrastructure using intermittent renewable energy sources.

In line with our quest to seek opportunities for renewable energy use, SingTel's Pulau Ubin Microwave Station will be switching to the micro-grid installation for its energy needs. It will be powered by clean energy sources including biodiesel and solar photovoltaic panels.

With this new photovoltaic plant, which is due for completion end-2014, the station will no longer need to rely on its existing diesel generators for electricity.

Renewable energy use (GJ)

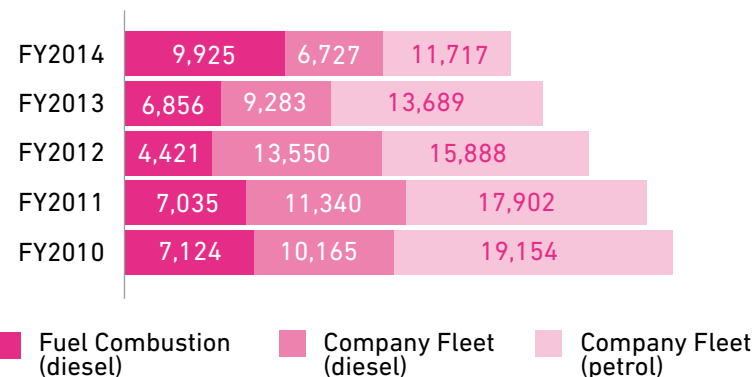


Fuel use

Our use of primary fuels consists of petrol and diesel for our commercial vehicle fleet and diesel for backup power supply generator sets. Our total fuel use in FY2014 decreased by 4.9% to 28,368 GJ compared to 29,829 GJ in the previous year. This is due to lower usage of our petrol vehicle fleet.

In FY2014, we added 2 Euro IV compliant diesel vans to our existing company fleet. To date, 29% of our company fleet are greener vehicles – 113 Euro IV compliant vehicles and 1 electric van.

Direct fuel use (GJ)



Energy efficiency in our data centres

Energy use from our data centres accounted about 26.6% of our total energy use in FY2014. This is projected to increase as consumer demand for mobile and data services grows. 3 chillers were overhauled during the year, resulting in energy savings of 1,688 GJ. This is equivalent to a reduction of 233 tCO₂e.

In addition to existing energy efficiency measures, we plan to overhaul 6 chillers at Kim Chuan Telecommunications Complex-1 in FY2015 which will result in an estimated savings of 336 GJ, equivalent to 47 tCO₂e per year.

REDUCE OUR IMPACT ON CLIMATE CHANGE AND GHG EMISSIONS

Emissions monitoring and reporting continue to generate high interest from a range of stakeholders in Singapore. We monitor developments and expectations relating to greenhouse gas (GHG) emissions and aim to improve our systems and meet the best reporting standards. Our ICT technologies enable companies to operate globally with higher productivity and efficiency (e.g. through the use of cloud services and reducing the need to travel with videoconferencing). We are committed to minimising our carbon footprint and that of our customers as our business grows.

Our priority is to manage our Scope 2 carbon emissions from electricity use across our networks, data centres and building operations which account for more than 90% of our carbon footprint. We are doing this by investing in more energy efficient projects and exploring opportunities to reduce electricity use or use renewable energy.

In FY2014, SingTel was included in the CDP Asia (ex-Japan) 2013 Climate Disclosure Leadership Index and recognised for best disclosure score in the category of Best New Responding Companies. This is attributed to the level of detail and comprehensiveness of our disclosure which includes an extensive Scope 3 emissions reporting.

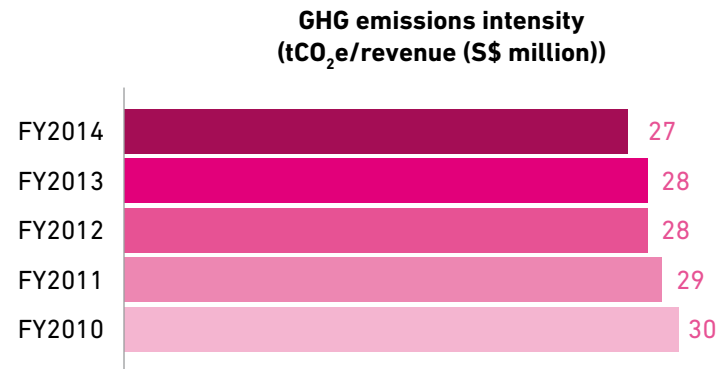
Our new initiatives in FY2014 included:

- Expanding the measurement of our carbon emissions to include the SingTel Exclusive Retailers (franchisees); and
- Reducing number of delivery trips to our SingTel Shops and retailers from twice to just once a day, saving over 21,000 km in distance travelled.

Our Scope 1 GHG emissions comprise refrigerant gases used in air-conditioning systems and direct fuel use. Scope 1 emissions in FY2014 were 7,269 tCO₂e, an increase of 5.4% due to the topping up of existing R22 refrigerants. We are in the process of phasing out chillers that use this ozone depleting refrigerant.

Scope 2 emissions comprising directly purchased electricity are the largest contributor to our overall GHG emissions. Our net overall emissions from indirect energy decreased 2.9% from FY2013 to 172,196 tCO₂e due to a lower simple operating margin grid emission factor from the National Environment Agency.

In FY2014, we engaged and worked with our SingTel Exclusive Retailers (franchisees) to include their electricity consumption in our Scope 3 GHG emissions in an effort to expand our measurement and reporting. Scope 3 emissions stood at 6,838 tCO₂e in FY2014, almost 40% higher than the previous year. This is also attributed to more air travel as a result of increased overseas business activities.



Equivalent CO₂ Emissions^[2]

tCO ₂ e	FY2010	FY2011	FY2012	FY2013	FY2014
Scope 1 (direct)					
Refrigerant gases	1,501	4,364	4,354	4,878	5,334
Fuel combustion – diesel	529	516	324	502	727
Company fleet – diesel	755	831	993	680	493
Company fleet – petrol	1,314	1,093	970	836	715
Total Scope 1 emissions	4,099	6,803	6,641	6,897	7,269
Scope 2 (indirect)					
Purchased electricity	172,547	177,635	175,634	177,321	172,229
less					
Renewable energy	(25)	(23)	(36)	(25)	(33)
Total Scope 2 emissions (net)	172,522	177,611	175,598	177,296	172,196
Scope 3 (other indirect)					
Contractor fleet – diesel	705	711	671	644	724
Contractor fleet – petrol	115	134	132	97	109
Air travel	3,021	2,628	3,064	2,352	3,908
Employee commute	NA	NA	NA	1,821	1,821 ^[3]
SingTel Exclusive Retailer	NA	NA	NA	NA	276
Total Scope 3 emissions	3,841	3,473	3,866	4,914	6,838
Total tCO₂e emissions (net)	180,462	187,887	186,105	189,107	186,303

[2] The GHG emissions reported in the table is based on the reporting requirements of the WRI and WBCSD 'GHG Protocol Corporate Accounting and Reporting Standard'. The equivalent CO₂ 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). 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] The employee commute carbon emissions data was collected in FY2013 and will only be updated when there is a significant change in our company's operations or workforce



MANAGE WASTE AND HAZARDOUS MATERIALS RESPONSIBLY

We actively monitor our waste management practices both as part of doing business and in the corporate environment.

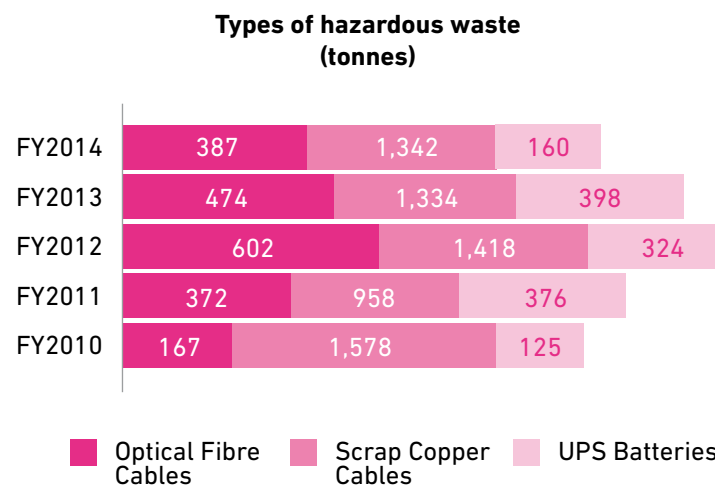
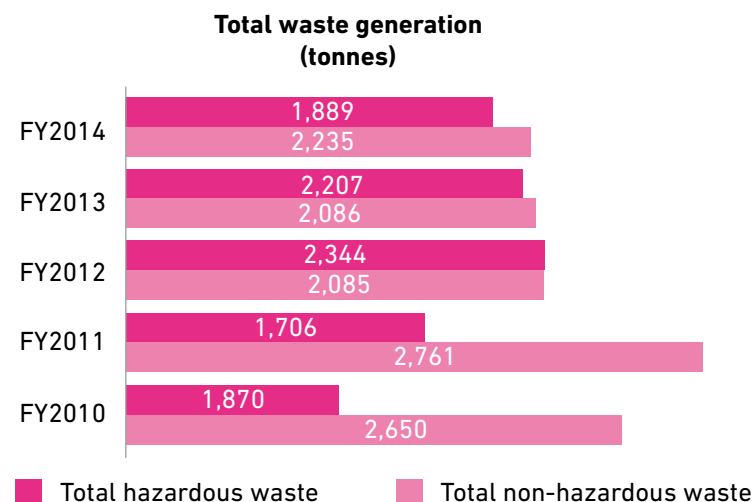
The success of our waste management strategy depends on the awareness of how and when we generate waste. We have continued to undertake initiatives in FY2014 to create awareness among employees and promoting best practices.

Our EMS ensures that we follow responsible waste disposal practices by continuing to monitor our waste by the types of materials used and disposed. Hazardous waste types include scrap optical fibre and copper cables as well as lead acid batteries. Non-hazardous waste includes cafeteria and general solid waste. In FY2014, we disposed a total of 4,124 tonnes of waste, of which 25.6% was recycled.

Hazardous waste

Electronic and other network waste contains toxic materials that run the risk of environmental damage through land, water or air pollution. Therefore, we ensure responsible disposal of hazardous waste through registered and licensed waste management companies. We will reuse and recycle network equipment where possible.

We disposed 1,889 tonnes of hazardous waste in FY2014, of which 50% was recycled, primarily through recycling scrap copper cables. The reduction of 14% compared to FY2013 is due to fewer disposal of lead acid batteries in our network operations.



SingTel-Nokia mobile phone recycling programme

SingTel was the 1st to introduce an operator-led mobile phone recycling programme in Singapore via a partnership with Nokia. Since 2011, we have been providing a channel for customers and the public to recycle their old mobile phones, chargers and accessories regardless of brand. SingTel and Nokia donated S\$5 to the SingTel Touching Lives Fund for every phone recycled between 1 April 2013 and 31 March 2014. Over 3,000 mobile phones were collected in the year via postal service and our mobile phone recycling bins located across the country. Since the inception of this programme, we have collected more than 5,000 mobile phones.



Non-hazardous waste

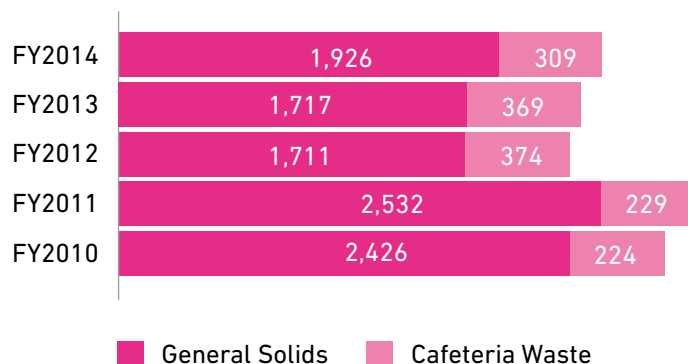
We are committed to reducing, reusing and recycling the waste we produce. We provide recycling points in offices to encourage our people to recycle, and promote double-sided printing to save paper. In FY2014, we disposed 2,235 tonnes of non-hazardous waste and recycled 97 tonnes of paper. The year-on-year increase of 7% is due to more disposal of solid waste in our building operations.

In FY2014, we completed the rollout of the managed printing system (MPS). The system holds the print job request until the users release the document for print by tapping their staff access cards on the network printer.

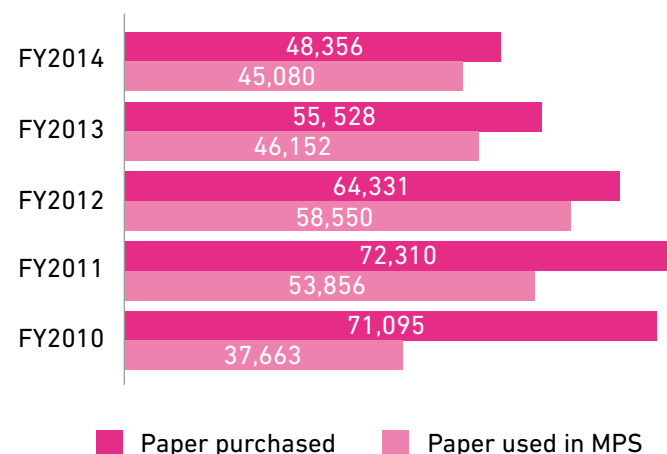
In the event that users forget their print requests, the system will delete the jobs within a specified period. This will automatically reduce the number of unnecessary print jobs. Our usage of paper via the MPS declined by 1,072 reams compared to FY2013.

Refer to Responsible Procurement section on page 17 for details of our 'Paperless Tender Pack' initiative.

**Types of non-hazardous waste
(tonnes)**



**Paper purchased vs Paper consumed via MPS
(reams)**



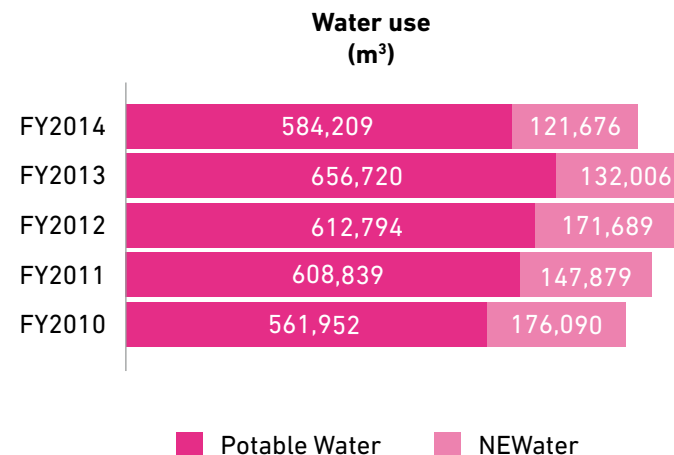
CONSERVE AND MANAGE WATER USAGE

Our operations use relatively lesser water compared to other industries and we do not consider water a material environmental aspect. However, we recognise that water is becoming an increasingly important issue, particularly in water scarce countries like Singapore. We monitor and aim to reduce water use in our building operations.

Total water consumption at SingTel consists of potable and NEWater. NEWater is high-grade reclaimed water used mainly for operational activities such as cooling.

Valuing the importance of this scarce resource, we have taken steps to minimise our water consumption. We have obtained certification under PUB's Water Efficient Building (WEB) programme for all our premises, including rented offices, and also put in place processes for early detection of water leakages.

As a result of our efforts, we have seen considerable savings in water consumption this year. Our total water use declined 10.5% from 788,726m³ in FY2013 to 705,886m³ in FY2014.



Biodiversity

Although biodiversity is not a material environmental aspect, SingTel acknowledges that it is a global concern. We have identified 2 main operations that could potentially pose a threat: cable laying and siting of base station sites in nature areas. We have not encountered any significant biodiversity issues in FY2014.

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.