08 ENVIRONMENT

We are committed to understanding, managing and minimising our environmental footprint across our value chain, including our business operations, suppliers and customers.

OUR APPROACH

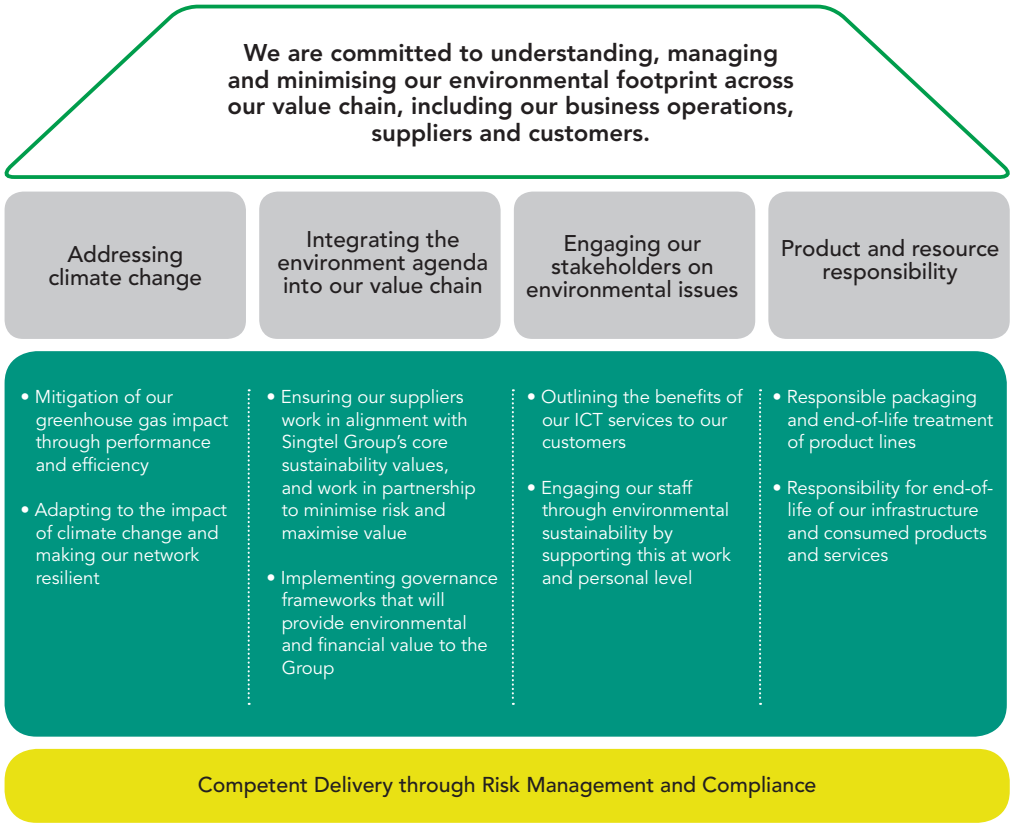
We will achieve this by delivering on our four strategic pillars of:

- Addressing climate change
- Integrating the environment agenda into our value chain
- Engaging our stakeholders on environmental issues
- Product and resource responsibility

As we expand our network and infrastructure to cater to the growing demand for our services, we need to ensure that we operate as efficiently as possible to minimise our impact on the environment.

In FY2015, we reviewed our environmental activities across the business and aligned our approach across Singapore and Australia. We have also updated the Singtel Group environmental policy, established a new strategy and revised our environmental governance structure.

SINGTEL GROUP ENVIRONMENT STRATEGY



CLIMATE CHANGE DMA G4-14

We are guided by our Environmental Management System (EMS) which supports our commitment towards climate change. Aligned with the ISO 14001 management system, it provides direction on the management of key environmental aspects in the planning, design, construction and operation of our core network.

Singtel adopts the precautionary approach to address our potential environmental impact. For example, our Sustainable Supply Chain Management Framework considered the risks in the geography of our vendors' operations (page 22–24). We will also be conducting a Life Cycle Analysis and a climate change adaptation analysis in FY2016.

CLIMATE CHANGE AND ENERGY MANAGEMENT

To address climate change, we focus on two key areas. Firstly, we look at mitigating our greenhouse gas emissions by improving our energy performance and efficiency. We focus on reducing electricity and fuel use in our business operations which represents 95% of our total carbon emissions.

Secondly, we recognise the importance of building and maintaining a resilient network in the face of climate change. Hence, we are undertaking a detailed climate change adaptation analysis across the Singtel Group in FY2016.

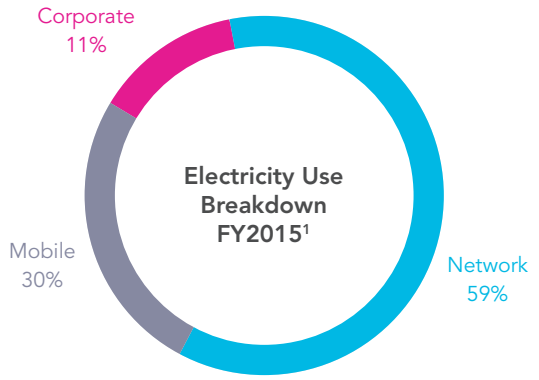
Today, smart technology and services such as cloud computing and audio or video conferencing provide opportunities to reduce emissions for our business and the wider community. We are investing in innovating solutions to reduce our energy and emissions across our network, exchanges, mobile business and office facilities (see story on page 42: *Supporting a mobile application on energy efficiency*).

Energy Performance and Efficiency

The growth in demand for mobile and ICT services has resulted in a corresponding increase in energy consumption to operate our networks. About 90% of Singtel Group's electricity consumption is associated with our networks (Figure 8.1). Hence it is important that we take active measures to improve our energy efficiency and minimise our dependency on non-renewable energy.

The main areas of energy use within our Group include network infrastructure (telephone exchanges, base stations, mobile access network and satellite earth stations), data centres, office buildings and retail stores. Our group's total energy use and energy intensity in FY2015 were 2.87 million GJ and 167 GJ/S$ million revenue respectively.

Figure 8.1: Distribution of electricity use



[1] Network refers to telephone exchanges and data centres
Mobile refers to base stations and mobile access network
Corporate refers to offices, centres and retail stores

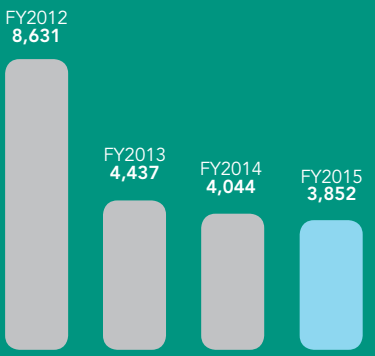
Energy Efficient Mobile Base Stations

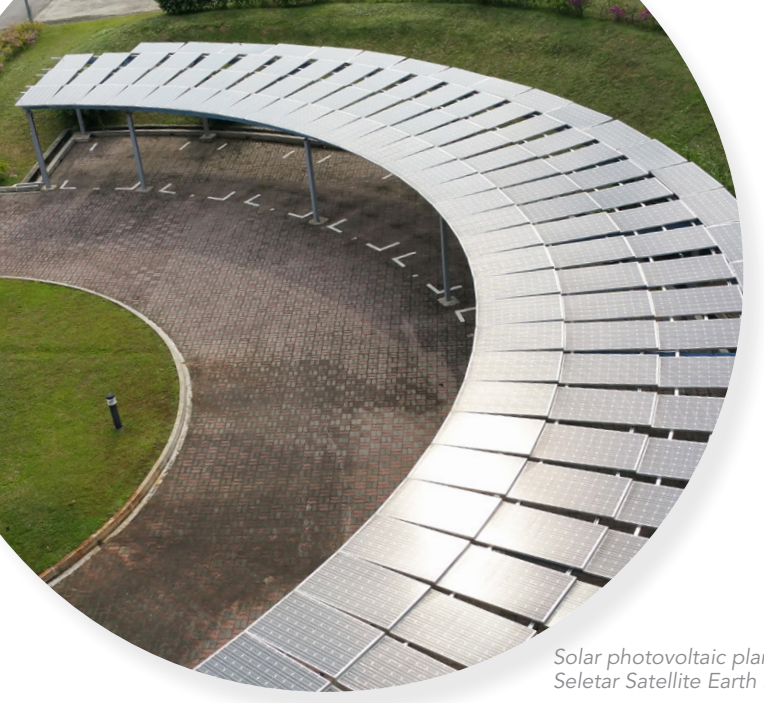
Over the past three years, we have put in place a plan to upgrade and convert existing mobile base stations to energy efficient ones in Singapore.

As at 31 March 2015, 97% of all our base stations, new and existing, was converted to 'green' base stations despite a rise in the number of base stations installed across the country.

Although the absolute electricity use from our base stations increased by 10 GWh in FY2015 compared to FY2014, we achieved a 5% reduction in energy use per cell carrier and have seen a steady reduction in the trend.

Electricity use per cell carrier (kWh)





Solar photovoltaic plant at Singtel's Seletar Satellite Earth Station

Getting Smart

In Australia, one of Optus' biggest programmes to reduce energy has been to upgrade over 500 base stations with smart metering. Just like meters on a home, they allow us to monitor the energy use at each station by the hour so that we can see when our consumption goes up or down due to network traffic. The data that these meters provide gives us the knowledge to better manage our energy consumption and ultimately helps us influence future equipment use and network design.

Next year, we plan to upgrade up to 500 base stations to continue to help us identify cost effective ways to save both energy and emissions.

In addition, we now enjoy cost savings at our telephone exchanges from free cooling, which is now a standard design feature of all new mobile facilities where the climate is suitable.

Sustainable Energy Sources in Singapore EN6 EN19

Our stakeholders understand that reducing energy consumption while growing business simultaneously can be a challenge. To mitigate this, we constantly explore opportunities to utilise alternate forms of energy for our operations.

Since 2009, we have been exploring opportunities to use sustainable energy sources for our operations in Singapore in an effort to reduce our reliance on electricity from the grid.

2009 @ Pasir Ris Telephone Exchange

- Grid-tied Solar Photovoltaic System consisting 192 photovoltaic panels
- Energy savings of 1,008 GJ (equivalent to 141 tCO_2e*) to date

2011 @ Bukit Timah Hill Radio Station

- 100 solar panels
- 3 wind turbines
- Energy savings of 173 GJ (equivalent to 24 tCO_2e) to date

July 2014 @ Pulau Ubin Microwave Station

- Solar photovoltaic plant and use of biodiesel as part of the Energy Market Authority's test-bed micro-grid installation at Pulau Ubin island
- Estimated energy savings of 75 GJ (equivalent to 9 tCO_2e) per year

November 2014 @ Seletar Satellite Earth Station

- Solar photovoltaic plant installed with a solar tracker to harness as much available solar energy as possible during the day
- Estimated energy savings of 192 GJ (equivalent to 24 tCO_2e) per year

* Based on the latest simple operating margin grid emission factors by the National Environment Agency in Singapore

Energy Efficiency EN6 EN19
We have begun to enjoy savings from energy efficiency projects implemented across our operations over the past years.

• Chiller Overhaul and Replacement Programme
Chillers are often a building's single biggest use of electricity. It is therefore important for us to ensure that our chillers operate in the most efficient manner. We do this through our chiller overhaul and replacement programme.

In FY2015, we overhauled six chillers in our Singapore operations and plan to do so for another six units in the coming year. We have also continued the cyclical replacement of ageing chillers, targeting those that have been in operation for 15 years or more. We replaced one unit of a 300RT chiller in Pickering Operations Complex with a higher efficiency unit and are currently in the process of replacing eight chillers located at our telephone exchanges and commercial buildings.

This programme alone has generated energy savings of 837 GJ (equivalent to 105 tCO_2e) since implementation in August 2014.

• Energy Saving Lighting System
Our first trial of the Performance Enhancement Lighting Management System (PELMS) was at the Telok Blangah Telephone Exchange in Singapore in 2012, allowing lighting levels to be automatically managed based on motion detection. The average energy savings achieved was about 45% of the lighting budget for the building.

The PELMS project has since been rolled out to seven telephone exchanges and two satellite earth stations in FY2015 with estimated energy savings of 859 GJ (equivalent to 107 tCO_2e per year).

Supporting a Mobile Application on Energy Efficiency
An Australian start-up Wattcost beat over 500 developers across India and Asia in the first ever Singtel Group-Samsung Regional Mobile App Challenge. Wattcost is a free mobile app which, along with an affordable wireless beacon, analyses energy use and sends real-time alerts to help customers optimise their energy consumption and save electricity costs. Wattcost will work with us and Samsung to take its app to over half a billion mobile customers across Asia and Africa.

The challenge is part of a larger Group-level collaboration to identify innovative start-ups and help them accelerate their development, while improving the smartphone experience for our customers.

Building Resilience
We understand the importance of our role as a leading provider of ICT services to our customers and community. This is why we are working to 'future-proof' our network against the impact of climate change.

In Australia, over the last 12 months, we have experienced devastation in Queensland with Cyclone Ita in April 2014 and Cyclones Lam and Marcia in February 2015. On both occasions our network team worked closely with local emergency services to restore affected mobile sites as quick as possible. With scientists predicting more extreme weather events in the future, it is critical that our networks and services are resilient to keep our customers, businesses and communities connected.

This work will continue to be a strong focus for us over the coming years in order to future-proof our infrastructure. We know we cannot do it alone to address this systemic issue. We are a founding partner and active member of the Australian Business Roundtable for Disaster Resilience & Safer Communities, as well as a member of the Australian Green Cross Business Adaptation Network. In both partnerships, we work with other major Australian companies to tackle this important issue and help Australian communities respond better to natural disasters. G4-16

VALUE CHAIN INTEGRATION

We are committed to collaborating with transparent, ethical and environmentally and socially responsible suppliers. While we understand the environmental risks present in our supply and value chain, we see this as an opportunity for us to integrate the environment agenda into our value chain.

We have established an approach to Singtel Group's Sustainable Supply Chain Management (page 23). This will ensure that our suppliers work in alignment with the Group's core sustainability values, and in partnership with us to minimise risk and maximise value to both parties. In Australia, we are also working to integrate key requirements of the Australian Packaging Covenant into our business operations.

STAKEHOLDER ENGAGEMENT ON ENVIRONMENTAL ISSUES

Our employees are our greatest asset and the Singtel Group is committed to ensuring that they have opportunities to learn about environmental issues and volunteer in this space. Since the launch of our Project LESS Environmental Campaign in Singapore in 2011, we have invited subject matter experts on environmental issues to talk to our employees, organised eco-trips to places of environmental interest and seven runs of the popular annual Plant-A-Tree Day, and introduced several initiatives such as saying NO to sharkfin and our electronic waste recycling programme.

We understand that our enterprise customers are looking for better solutions for their businesses today. Hence we also focus on delivering efficient green ICT solutions such as providing the best cloud computing and security services while optimising our environmental impact. To ensure that we are focusing on the right impact areas, we will undertake a Life Cycle Assessment of our direct and indirect environmental impact in FY2016.

More than 1,600 staff volunteers have planted 800 trees in Singapore since 2009

Optus supports Mobile Muster in Australia

PRODUCT AND RESOURCE RESPONSIBILITY

We actively monitor our waste management practices both as part of doing business and in the corporate office environment. We continued to undertake initiatives in FY2015 to create awareness among employees and promote best practices in waste management.

Electronic waste has a significant impact on the environment. Many electronic devices contain heavy metals such as lead, cadmium, mercury and arsenic. If not handled properly, these can poison our environment and threaten the health of individuals and communities.

E-waste contains a combination of reusable raw materials as well as toxic materials. The raw materials have value and can be reused to manufacture new products. The appropriate handling of e-waste can prevent serious environmental damage and recover valuable materials especially metals.

We encourage our customers and employees to reduce, reuse and recycle.

- We offer our customers a buy-back scheme so that end-of-contract phones can be reused. In Optus, we have been proudly supporting Mobile Muster since 1998, enabling customers to recycle their old mobile phones free of charge by taking them to any Optus retail outlet. In Singapore, we have extended our mobile phone recycling programme in FY2015 to collect e-waste related to our products and services such as laptops, modems, routers and cables. G4-16

- We are committed to responsible packaging and have responsibilities under the Australian Packaging Covenant. This year we commenced a packaging review with a multi-stakeholder group to implement a best–in-class packaging campaign. This has identified some key initial improvements in our choice of cardboard products. G4-16

- We also reuse and recycle all our Optus IT equipment like servers and computers. We recently undertook a significant sustainable asset management disposal programme that saved significant cost. We were able to identify key pieces of equipment for reuse and achieved above 90% recycle rates on materials that would otherwise have been disposed to landfill. This successful initiative has continued as part of our day to day operations.

LOOKING AHEAD

We target to implement the new Singtel Group Environment and Energy framework to effect the following:

- Assess the long-term energy impact of new procured technologies within our operation
- Establish e-waste recycling capability for the broader scope of e-waste
- Conduct environment life cycle impact and climate change adaptation exercise

Undertaking a Life Cycle Assessment (LCA) is an effective way to determine the direct and indirect environmental impact across our business. In FY2016, we will undertake a detailed LCA that will help us build on our existing environmental programmes to address areas of the business that create the biggest impact. The LCA will also guide our sustainable supply chain work.

To ensure that we operate a resilient, extensive and quality mobile network, we will undertake a detailed climate change adaptation analysis across Singapore and Australia. This exercise will help us understand the projected impact of climate change on our assets and ensure that we build resilience measures into our design, construction and upgrade of new and existing facilities.

In FY2016, we will identify and assess which facilities, networks and base stations that are the most exposed to the physical impact of climate change such as bush fires, sea level rising, floods, fire and cyclones so that we can develop plans to adapt and ensure business continuity and limit down-times during emergencies.

Singtel e-waste recycling programme in Singapore

ENVIRONMENTAL PERFORMANCE INDICATORS EN3 EN5 EN15 EN16 EN17 EN18

Environmental Performance Indicators	FY2015		
	Singtel	Optus	Singtel Group
Total Energy Use (GJ)	**1,338,904**	**1,533,360**	**2,872,264**
Energy Intensity (GJ/S$million revenue)	**182**	**155**	**167**
(i) Electricity Use (GJ)	**1,316,905**	**1,494,342**	**2,811,247**
Network	848,989	801,349	1,650,338
Mobile	247,855	610,268	858,123
Corporate	220,061	82,724	302,786
Electricity Intensity (GJ/S$million revenue)	**179**	**151**	**163**
(ii) Electricity use from renewable sources (GJ)	**303**	**464**[1]	**768**
(iii) Fuel use from non-renewable sources (GJ)	**21,696**	**39,018**	**60,243**
Total Carbon Emissions (tonnes CO_2 equivalent)[2]	**176,454**	**402,750**	**579,205**
Scope 1	**5,947**	**2,694**	**8,641**
Refrigerants	4,477	N.A.[3]	4,477
Fuel combustion	446	252	698
Company fleet	1,024	2,442	3,466
Scope 2	**164,577**	**374,825**	**539,402**
Scope 3	**5,931**	**25,231**	**31,162**
Contractor fleet	766	6,954	7,720
Air travel	3,141	8,564	11,705
Employee commute	1,821[4]	9,713	11,534
Retail franchisees	202	N.A.	202
Carbon Intensity (tCO_2e/S$ million revenue)	**24**	**41**	**34**
Total Water Use (m^3)	**691,389**	**60,422**[5]	**751,811**
Total Waste – hazardous and non-hazardous (tonnes)	**4,015**	**1,425**	**5,440**

1 Optus electricity use from renewable sources has been accounted for in total Electricity Use.

2 The carbon 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 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 and from corresponding states in Australia. 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 Optus uses a combination of air, water and refrigerant cooling systems. Refrigerants are not included in this report for consistency with the reporting requirements set by the Australian National Greenhouse and Energy Reporting Act 2007.

4 Employee commute carbon emissions data will be updated only when there is a significant change in our company's operations or workforce.

5 Water use includes Optus Campus Sydney only.