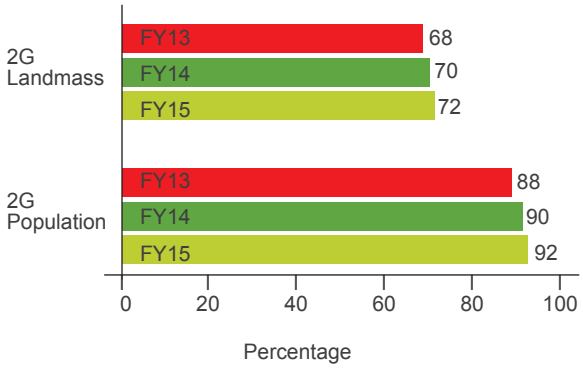
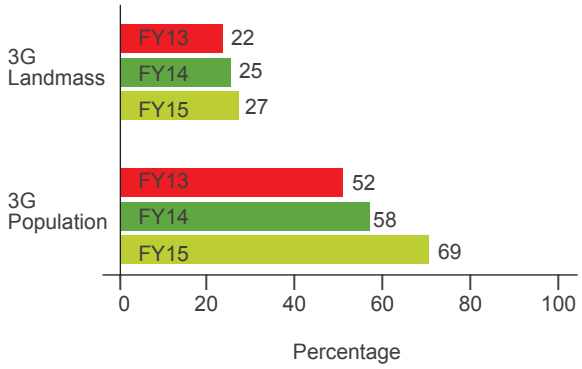
NETWORK QUALITY

Our network is core to our business. The quality and availability of our network is an essential part of our business since all of the services we provide to our customers are delivered through the network platform. Our network allows us to differentiate ourselves in a highly competitive market and is the medium through which we transform lives. It is also a dynamic environment that constantly evolves as we keep up with growth, both in terms of number of customers (e.g. volume of traffic) and their increasingly sophisticated needs.

PERFORMANCE HIGHLIGHTS

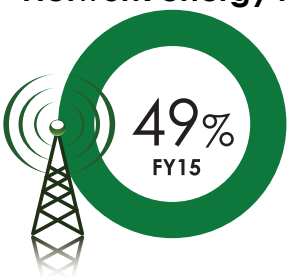
Network Coverage

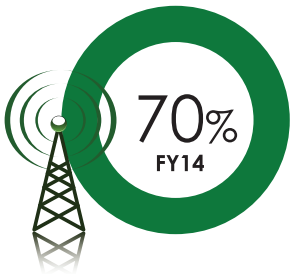


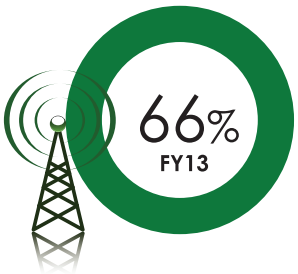


FY16 Target: 2G 93%, 3G 80 % (% population coverage)

Network energy failure rate*







FY16 Target is 40%

* Power failures as a percentage of total network failures. Safaricom's availability target for the network is 99.95%, therefore a network energy failure target of 40% translates to a network unavailability of 0.02% (40% of 0.05%)

	FY16 Target	FY15	FY14	FY13
Cost of energy consumption by site (KSH per month)*	51,000	51,626	56,993	62,175

*Energy consumed is electricity, diesel and solar. The sources are supplier monthly fueling data and KPLC bills. Solar energy is measured only at some sites as such we have extrapolated the solar data to the other sites. Energy mix influences the cost.

MANAGEMENT APPROACH

In terms of **network quality,** a key constraint is the fact that spectrum is allocated evenly among network providers in Kenya. This limitation means that the coverage and adequacy of our network is put under pressure as the number of our customers continues to grow. Our response to this is primarily managed through our Best Network in Kenya (BNK) programme, which remains a strategic pillar of the company, and through the corresponding regulatory Quality of Service (QoS) targets.

While the delivery of network quality is the responsibility of all teams within our Technology Division, the accountability and coordination for this material matter lies with the Quality & Service Assurance Department.

In terms of **network availability,** a key factor is ensuring a secure and sustainable supply of energy. The reliability and growth of our network is directly dependent on the availability of energy. Any interruption in energy supply, such as grid electricity outages and national shortages of diesel fuel, poses a direct challenge to the continuity of our operations. Energy security and efficiency is increasingly important as we look to expand our network, particularly in rural areas that have less reliable access to grid electricity.

Our response to this is primarily managed through our energy failure rates (minimising energy outages at sites by deploying a mix of energy supplies, including grid, generator and alternative sources) and consumption targets (reducing the amount of energy consumed at sites by deploying more energy-efficient technologies and alternative energy solutions).

The Regional Network Operations Department within the Technology Division is tasked with the management of network energy solutions.

We also monitor and manage the consumption of energy in our facilities and have a number of ongoing initiatives in place in this regard. These include installing solar water heating systems where possible in our buildings and deploying energy efficient, intelligent Building Management Systems and LED lights in all facilities and shops (as part of the ongoing refurbishment cycle).

The Facilities, Safety and Health Department is responsible for the management of energy consumption in Safaricom facilities.

ACHIEVING INDEPENDENT CERTIFICATION

It has been a busy, challenging and successful year from a network quality perspective. One of our major commitments last year was to maintain our BNK status in FY15 and we are pleased to be able to report that undertaking was achieved.

We also progressed from benchmarking the quality of our service to seeking independent certification of our performance for the first time this year. The Safaricom network was comprehensively evaluated by leading independent testing and engineering services company, P3 Communications, and was awarded the 'Best in Test' P3 certification for the best overall results among Kenyan operators.

Summarised results of the independent testing and evaluation of our network

Service	KPI	Mar-Apr2015*	Oct 2014	Oct 2013	Apr 2013	Sept 2012
Voice	Call Setup Success Rate	1st	2nd	2nd	1st	1st
	Dropped Call Ratio	2nd	2nd	1st	1st	2nd
	Speech Quality	2nd	2nd	1st	2nd	2nd
Data	Mean User Data Rates-Download	1st	1st	1st	2nd	2nd
	Mean User Data Rates-Upload	1st	1st	1st	3rd	2nd
	Mean Web Browsing Session Time	1st	1st	1st	1st	1st
	Network Delay	1st	1st	1st	2nd	2nd

1st Position 2nd Position 3rd Position

The independent measurement carried out by P3 between March and April 2015 is a Certification Benchmark measurement, unlike previous measurements that were only independent benchmarks. The Certification Benchmark criteria is composed of a comprehensive set of 29 KPIs for 'Big Cities', 'Small Cities' and 'Interconnecting Highways', with each KPI having a score.

The seven KPIs tabulated on page 29 is a simplified illustration of the full scope measured to help compare our performance over time. Additionally, the March-April 2015 measurement covered a total of 28 towns and highways (not 13 towns as previously measured). For October 2014 and Mar-Apr 2015, voice measurements were 'mobile to mobile' tests instead of 'mobile to fixed line' tests, which ensures the tests match our subscriber calling patterns more closely.

The full set of P3 certification results can be obtained from their web site at: http://www.p3-group.com/en/service-certification-22656.html

DEVELOPING OUR CAPACITY

One of the key indicators of our improved quality of service is the fact that we have been able to sustain our average dropped call rate at acceptable level of 0.3 %

This improvement is the result of our proactive drive to develop our capacity in recent years, including ongoing investment in our fibre network, the deploying of new sites, modernising our network equipment and the acquisition of competitor spectrum. Our increased capacity is also reflected in the 110% rise in data traffic (mobile) during the year.

INVESTMENT IN OUR FIBRE NETWORK

Fibre offers extremely fast speeds, high resilience and quick resolution of outages (as it is not leased and is under our direct management). We made very good progress in terms of our fibre network during the year and have now deployed more than 2, 010 kilometers in the five key cities of Nairobi, Mombasa, Kisumu, Nakuru and Eldoret. As a result 30% of our base stations are now connected to fibre, and 720 of 1,020 enterprise client buildings.

EXPANDING OUR NETWORK

Base stations by type (total)

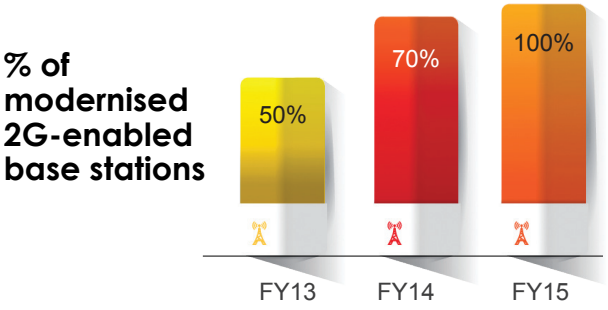
	FY15	FY14	FY13	FY16 Target
2G-enabled	3,382	3,140	2,905	3,811
3G-enabled	1,943	1,847	1,604	2,984
4G-enabled	236	-	-	462
UMTS 900-enabled	543	100	-	1087

We continued to expand our network during the year and a total of 242 2G-enabled and 96 3G-enabled base stations were rolled out across the country. We also became the first operator in Kenya to deploy 4G, which offers between five and 10 times faster speeds than 3G, and rolled out 236 4G-enabled base stations in the cities of Nairobi and Mombasa.

As part of our ongoing commitment to use our network for 'the greater good' where feasible, we also rolled out 33 strategic 'security sites' in 15 counties. Located in areas with little or no infrastructure, these sites provide the local authorities in security hotspots with the vital ability to communicate and better coordinate their efforts.

An innovative solution to the issue of low 3G penetration inside buildings in high-density urban environments is to co-opt any surplus capacity in the 900 MHz frequency band (conventionally utilised by 2G services). The solution is known as UMTS 900 and it has been successfully deployed at 543 base stations in Nairobi and Kisumu to date.

MODERNISING OUR 2G NETWORK



We also reached the significant milestone of fully modernising our 2G network during the year. Started in 2013, this initiative ensures service accessibility during peak hours and involved upgrading the equipment used in our Radio, Transport and Core platforms. The final 460 2G-enabled base stations were modernised during the year.

SPECTRUM ACQUISITION

Additional spectrum and capacity was also obtained during the year through the acquisition of local operator yuMobile from Essar Telecom Kenya Limited.

BRINGING M-PESA HOME

Another of our major commitments last year was to make the M-PESA platform more fortified, resilient, robust and scalable. This was achieved by relocating our M-PESA servers from Germany to Kenya and upgrading to a second generation iteration of the platform. An ambitious undertaking, the transfer was successfully completed in April 2015. The relocation and upgrade has already translated into improved transaction response times, minimal delays and more system stability. The new platform will also allow for faster and more flexible deployment of new products and services.

NETWORK AVAILABILITY AND ENERGY EFFICIENCY

The availability of our network remains a critical necessity and we are pleased to be able to report that our energy failure rate (power failures as a percentage of total failures) dramatically dropped during the year. At the same time, we met our target of reducing energy costs per site by 10% this year and we continued to deploy a range of energy availability and efficiency initiatives throughout the network.

IMPROVING ENERGY AVAILABILITY

The excellent accomplishment of reducing our energy failure rate by 30% is the result of a combination of initiatives, including our ongoing work with the Kenya Power and Lighting Company (KPLC) and our investment in backup solutions, such as deep cycle batteries and alternative energy sources. We also invested heavily in power redundancy at our data centres during the year (for example, two power sources, two generators and two data recovery generators).

The following table describes the mix of energy sources used throughout our network and it tracks the progress of our key energy availability-related initiatives, which are described in further detail after the table.

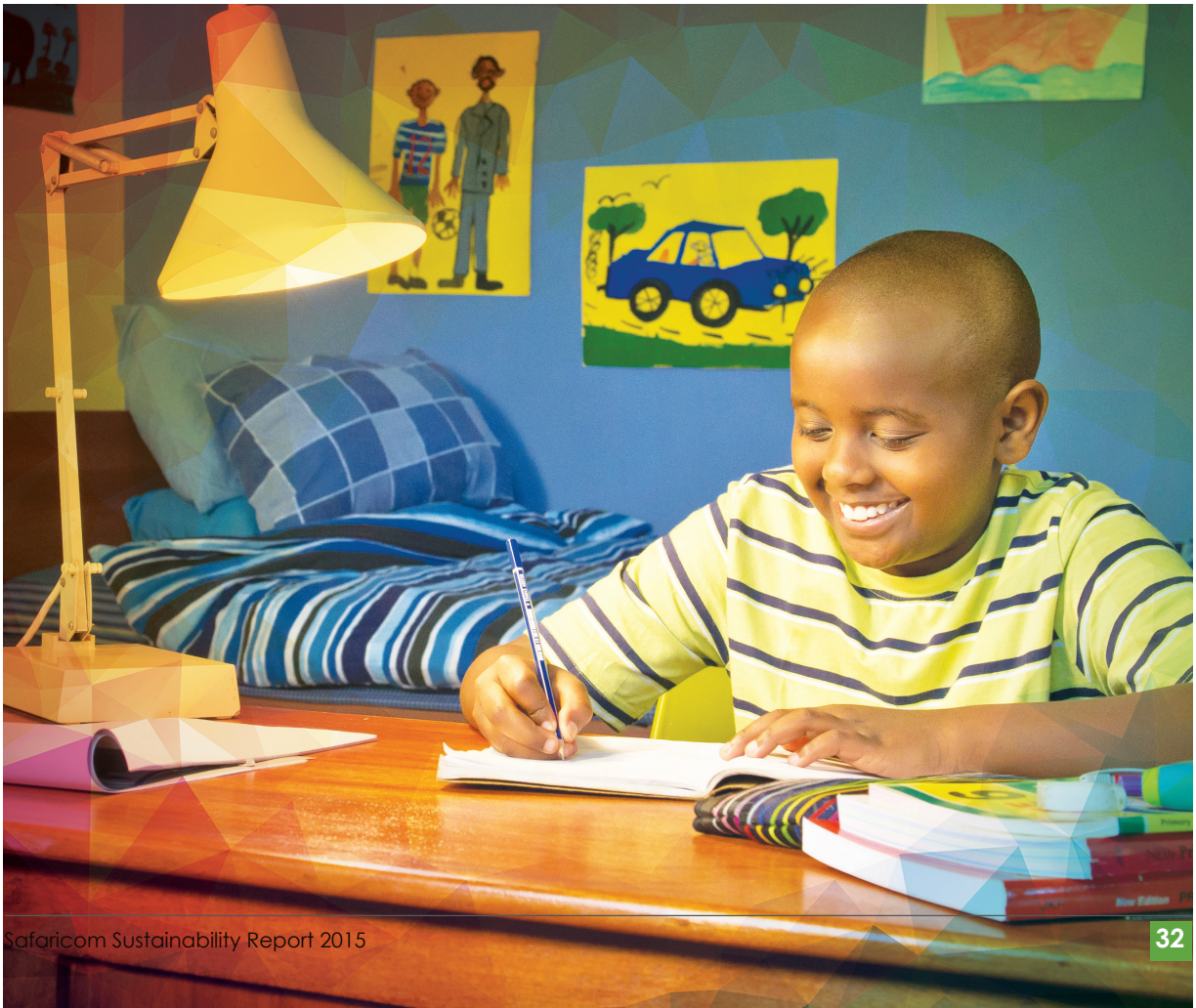
Network energy sources by site

(total at year-end)

	FY16 Target	FY15	FY14	FY13
KPLC* and genset	3,000	2,763	2,566	2,466
KPLC* (No generator)	508	323	303	297
24/7 diesel generator	0	41	17	79
Power cube (energy efficient generator)	104	91	79	34
Diesel generator/battery hybrid solution	0	11	13	6
Solar/wind hybrid solution	56	56**	65	55
Solar	77	36	12	12

* Kenya Power and Lighting Company (National grid supply)

**The reduction in hybrid sites is based on some of the wind sites not being functional. We will look at the business case (costs) to return functionality otherwise we will convert these sites into solar.



One of our ongoing schemes is to take swift advantage of extensions to the national grid and use this power to supply our sites (it being cheaper and cleaner than diesel generator produced energy).

This requires working closely with the KPLC and Rural Electrification Authorities (REAs). Currently, 94% of our base station locations are connected to the grid and we managed to connect 100% of the sites that we identified and targeted for this reporting period.

Another of our ongoing programmes is fitting sites with deep cycle batteries. These allow the sites to run on stored energy when grid electricity is not available. As well as providing cheaper and cleaner energy than diesel generators, these units and are more efficient than other batteries, last longer and are less vulnerable to theft and vandalism (as these supply 2 volts, which is not useful for many other applications). The batteries are also more environmentally friendly as they are made of Sodium-Nickel (instead of lead and sulphuric acid) and can be recycled.

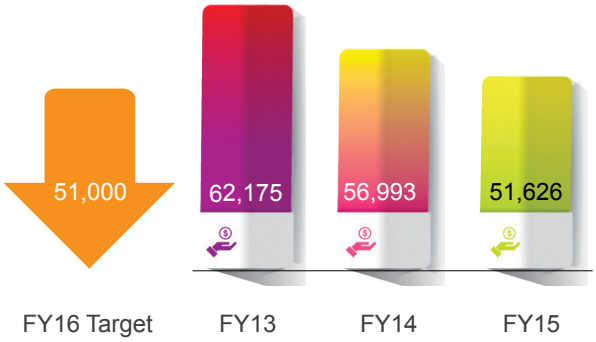
A further 48 sites were fitted this year and this completed our focus on our large transmission hub sites. From next year, we will start cascading this programme out to all of our sites.

IMPROVING ENERGY EFFICIENCY

As our network continues to grow in size and sophistication, making it more energy efficient and intelligent becomes more important. Our vision is to create a powerful, streamlined network that uses the minimal amount of energy to deliver its growing array of services. One that transforms the lives of the communities it serves with the lightest of environmental touches.

From an energy-efficiency perspective, it was a year of maintaining the rate of progress started in FY14 and continuing with the same initiatives. We are pleased to have achieved our target of reducing energy costs per site by 10%, especially since many of our equipment supplier contracts came to an end during the year. This transition is a wonderful opportunity to research the very latest solutions available, but it has delayed some projects — our renewable energy programmes, for instance — as we onboard the right partners and solutions to take us forward.

Cost of energy consumption by site
(KSH per month)



One of our ongoing programmes is to replace our standard diesel generators with power cubes. These are extremely efficient hybrid energy systems in which all the power components are housed in one enclosure. The components (generator, fuel tank, DC power system, batteries and controller) are all factory integrated to reduce generator runtime, human interference, prolong battery life, reduce fuel theft and enable remote monitoring. We converted a further 12 sites during the year, bringing the total to 91. We are also replacing our standard generators with new, more efficient units as well.

We also rolled out the next phase of our Low-voltage Auto Phase Selectors (APS) initiative and a further 303 units were installed during the year, bringing the total number of units to 478 across the network. These units allow our sites to utilise grid power at voltages as low as 110V, which reduces the instances and lengths of time for which our generators have to run considerably.

Another initiative that we continued during the year was the instillation of free cooling units. These units reduce the cooling energy requirement at sites by exchanging the warm air inside with colder air from outside. As most of our sites are in areas of moderate temperatures, it has been possible to achieve significant savings with these units, especially at night. We installed a further 235 units during the year, increasing the total number of operational units to 640.

One of our goals this year was to create an energy baseline for the network, which we can use to benchmark ourselves against other operators and to create our SMART energy management programme. Although this process has yet to be completed, we successfully audited the sites targeted for the year in June (large sites with average energy consumption levels of 15,000 kWh or higher), which represents approximately 30% of all sites and 60% of all energy consumed. The next step is to audit a sample of the remaining smaller sites and then create our energy baseline. We plan to complete this process and publish our first energy baseline in the coming year.

We did initial energy audits and submitted reports to the Electricity Regulatory Commission. This exercise will continue into the next financial year. The energy policy has also been drafted awaiting approval from the Executive Committee. Going forward, we will be implementing the recommendations from the audits.

In the Environment Section of this report Page 40, we have provided a summary of diesel and electricity consumption. Currently, this data is not adequate for a complete energy baseline as it does not include solar and wind energy. Further the data is based on supplier invoices. We would like our energy and carbon emissions figures to be as accurate as possible, by ensuring inclusion of all energy sources.

LOOKING AHEAD

We are excited about the shift in strategy next year towards becoming an even more customer-centric organisation.

The Best Network in Kenya programme is being revamped and renamed the Best Network for You (BNU) in FY16 and our focus will shift to delivering an experience that is even more tailored to the specific needs and requirements of individual customers. We will still continue to measure our network quality through the independent P3 benchmark and have set ourselves the target of improving our score by at least 50%. Another key metric we will use to measure our BNU performance is the Net Promoter Score (NPS), which will allow us to monitor whether our customers are experiencing the improvements we make to the network.

Other network quality targets for the year ahead include: increasing 3G coverage to reach 80% of our customers; expanding our fibre footprint to a further 10 towns and connecting our fibre network to all 1,020 targeted enterprise buildings and to 8,000 residential homes in 50 housing estates; and upgrading our 4G services to include voice calls.

From a network availability perspective, our major targets for the year include: finalising and publishing our energy baseline; concluding our negotiations with suppliers and putting long-term contracts (three years or longer) in place; and co-investing in rural communities to share our surplus energy. We are very excited about this last commitment as it will help us to make a real difference in rural communities and to meet our mandate to transform lives. We have been reviewing proposals and our budgets to identify viable opportunities and we will start rolling these out in the coming year, such as helping to power remote clinics and providing community 'power points'.

Energy data capture still remains a challenge and this affects the accuracy of our consumption and carbon emissions. We shall continue with the installation of Automatic Meter Readers in our network throughout the country to improve data quality.

Despite the availability of renewable energy sources and encouraging policies, potential project developers in Kenya face many challenges, including complex regulatory requirements. There is still room for reduction on taxes and duties on green energy equipment and more incentives for investors in green energy.