



## Telefónica Uruguay cuts €4.2 million off its network energy bill with free cooling

Since 2002, Telefónica Uruguay has rolled out a series of energy efficiency initiatives across its network, resulting in cumulative cost savings of €4.2 million at 2012 prices and carbon emission reductions of 10 900 TCO<sub>2</sub>e, as part of an energy and carbon reduction programme. The implementation of these measures is reflected in Telefónica Uruguay's performance in the GSMA's Mobile Energy Efficiency Benchmarking service.

### Background

The Telefónica Group has invested more than €200 million since 2005 in Uruguay, where it is one of the largest mobile communities with more than 1.8 million customers. Telefónica Uruguay directly and indirectly employs 2 000 people with revenues of around €240 million a year and accounts for nearly 38% of the market. Uruguay has the third largest mobile teledensity in Latin America with a high rate of mobile penetration of over 140%.

Telefónica Uruguay has participated in the GSMA's Mobile Energy Efficiency Benchmarking service since the service's launch in 2010, as part of Telefónica Group's energy and carbon strategy.

### Opportunity

Telefónica Uruguay has focused on improving its energy efficiency for over a decade. The economic crisis of 2002 forced businesses to reduce costs and since then Telefónica Uruguay has focused on deploying a range of measures to reduce energy consumption and cut costs in order to mitigate the effect of rising electricity prices, which rose approximately 40% over 2002-2012 in real terms.

### Solution

Telefónica Uruguay implemented a series of measures to improve network energy efficiency and reduce costs over the period 2002 to 2012. Measures included:

- Installation of free air cooling in indoor cell sites and mobile switch sites, and free water cooling in mobile switch sites



- Deployment of capacitor banks to improve telecom load power factors in cell sites and buildings
- Installation of more efficient UPSs and rectifiers, with an average efficiency of 97%
- Optimisation of power tariffs by matching power needs to actual demand.

Of the energy efficiency measures listed above, free cooling had the largest impact in reducing energy consumption, and this case study focuses on the free cooling solutions deployed. Over the period 2002 to 2012, Telefónica Uruguay installed free air cooling in 85% of its indoor cell sites, as well as at a mobile switch site. Free air cooling reduces air conditioning equipment load when the external air temperature is sufficiently low to allow control of the internal temperature without the use of air conditioning.

More recently free water cooling has been implemented at mobile switch sites, controlling humidity and air quality in the switch site rooms. Here fans cool water using external air, therefore reducing the operation and power consumption of the chillers. The new free water cooling equipment avoids issues related to filter maintenance, humidity and external pollution. This increases reliability compared to free air cooling, and is highly energy efficient due to the new types of compressor technology used.

The first step was a feasibility study to evaluate Uruguay's environmental conditions, determine the feasibility of the solutions and set the parameters of use. A mathematical model was created to simulate annual variability, taking into consideration air inlet at a maximum temperature of 20°C and air outlet temperature at 25°C. The result of this study indicated that the free air cooling solution was viable and could be used all year round in indoor cell sites, as well as in the switch sites, located in mild regions of the country with few humid days. The study concluded that indoor cell sites exposed to salty air or near sources of pollution, e.g. sites near the sea or on roof tops close to chimneys, were unsuitable for the free air cooling solution because of reliability issues and the need for higher frequency maintenance. It was found at a later date that switch sites were suitable for the free water cooling solution and performance was better than using the free air cooling solution at these facilities.

## Results

Telefónica Uruguay trialled the solutions at a number of cell sites and at a switch site. The results were excellent and so the free air and water cooling solutions were rolled out to other suitable sites, identified in the feasibility study.

The installation of free cooling saved 27% of indoor cell site energy consumption on average, and 25% at the switch sites. Telefónica Uruguay implemented free air cooling in 85% of indoor cell sites which saved cumulatively 30 GWh of electricity, €3.5 million and 9 100 TCO<sub>2</sub>e of carbon emissions. The free air and water cooling solutions deployed at two mobile switch sites has saved 6 GWh of electricity, €0.7 million and 1 800 TCO<sub>2</sub>e of carbon emissions. Total cumulative savings were 36 GWh of electricity, €4.2 million and 10 900 TCO<sub>2</sub>e of carbon emissions. All euro savings figures are at 2012 prices.

“The implementation of these energy savings yielded significant cost savings at a time of a severe local economic crisis, and is well-aligned with the energy optimisation sought by Telefónica”, said Mr. Sérgio de Santis, responsible for project implementation.

The positive result was also reflected in Telefónica Uruguay's performance in the GSMA's Mobile Energy Efficiency Benchmarking service.

Telefónica is one of 35 mobile operators participating in the GSMA Mobile Energy Efficiency Benchmarking initiative.

For more information visit  
[www.gsma.com/mee](http://www.gsma.com/mee).