Enabling remote asset management of green energy cooking stoves by using M2M solutions

TERI, NexLeaf Analytics and Vodafone participate in Asia's largest trial of energy efficient green cooking stoves

16th July 2015

Vodafone Machine-to-Machine (M2M)

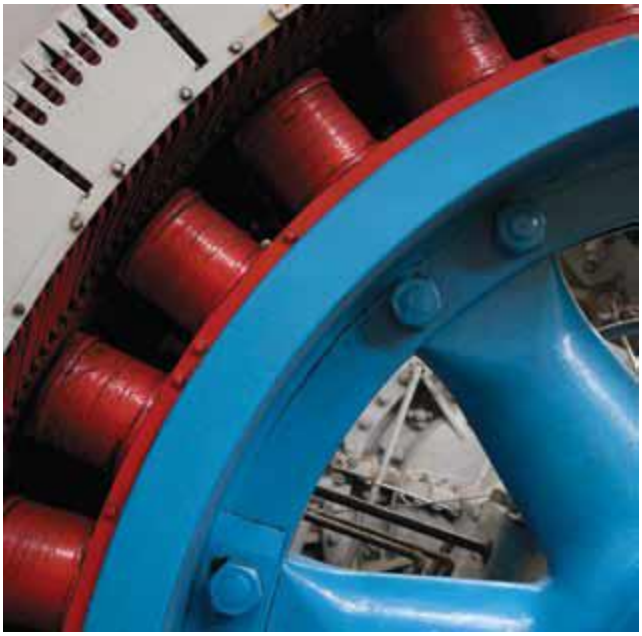
Contents

1. Summary

In India, 875,000 deaths occur every year due to Indoor Air Pollution. A team of cook stove suppliers, solar lamp manufacturers, NGOs, Rural Bank, academics and Vodafone is pioneering a new approach for encouraging rural women in India in using renewable technologies for cooking. Though clean cook stoves is an unglamorous topic it is important. Research suggests that switching to a clean biomass stove could reduce approximately five tonnes of carbon dioxide equivalent emissions (CO_2e) per household per year. It will also reduce air pollution by 60-70 per cent and cleaner air means better health for communities.

Project Surya is an international partnership between the University of California at San Diego (UCSD), The Energy and Resources Institute (TERI) New Delhi, and Nexleaf Analytics - Los Angeles. It aims to mitigate the regional impacts of global warming by immediately and demonstrably reducing atmospheric concentrations of black carbon, methane, and ozone. **The project focus is on replacing biomass burning inefficient cook stoves traditionally employed in rural areas, with clean-cooking technologies.**

This project plans to distribute clean cooking stoves to 5,000 households in rural India and reduce the cost of these clean cook stoves for families by incentivising usage-based financing. Supported by Vodafone's M2M managed connectivity solution, Project Surya is able to remotely collect stove usage data using a smartphone based application Stove Trace ("SootSwap"). This was developed by Nexleaf Analytics with support from The Qualcomm® Wireless Reach™ initiative, to create a business case for a global roll-out of clean cook stoves.



2. Problem Statement

There are an estimated 3.5 billion people relying on traditional heating and lighting around the world, the vast majority in the developing world. Household air pollution resulting from cooking with biomass kills three times as many people around the world as malaria, HIV/AIDS and TB combined.

India is a ticking bomb in terms of long term pollution related public health crisis. Clean cooking energy could reduce approximately five tonnes of carbon dioxide equivalent emissions (CO_2e) per household per year. It will also significantly reduce air pollution and ensure cleaner air in our communities. This, in turn, means better health for these communities, and saving public resources from being used for mass healthcare maladies.

However, it is important to measure the usage of these stoves because they entail a change in usage patterns which are difficult to prove. **Unless a team could centrally monitor and analyse the usage of these stoves, the probability of their continued usage and thereby change in usage patterns of end users was minuscule.**

Also, physically visiting 5,000 stoves across the many villages of rural India was unmanageable, the solution needed to use mobile based new technologies for remotely monitoring the usage of the stoves in each household.

3. Vodafone Solution

Working together with TERI and Nexleaf Analytics, the solution developed by Vodafone allows Project Surya to remotely collect data from Nexleaf's smartphone based StoveTrace sensor through the data network, including 3G, with the SIMs managed centrally through Vodafone's industry pioneering M2M Service Platform. Vodafone also offered reliable coverage in the state of Uttar Pradesh, a key area of focus for the project, and was able to create a viable commercial case. If coverage to an individual SIM drops out the SIMs automatically connect to another network.

Though the project team originally had bought SIMs at retail level, but this ended up costing them more for data than the households would receive in revenue which was not a reliable business model. Vodafone stepped in to give an end-to-end M2M solution of remote monitoring including data, managed connectivity and M2M special SIMs combined with an enterprise experience.

Project Surya is aiming for 5,000 households in a year and the distances between the sites could be hundreds of miles. Remote monitoring thus is the only viable option. Therefore, Vodafone's solution is the main reason of the project's success.

4. Why Vodafone

Vodafone's end-to –end remote asset management solution along with M2M Service Platform offering was a key differentiator as opposed to a piece meal approach available in the market. The coverage map also corresponded with the needs of the project. In addition, Vodafone was already a provider of services to TERI's corporate team. Vodafone's M2M Service Platform was well known to their organisations. TERI had worked with Vodafone in the past and their team was happy working with the same service provider for multiple requirements being centrally managed.

In the end, the key differentiator was a world class M2M portfolio unmatched by any other service provider in Indian market, enterprise grade customer experience and a reliable network that provided coverage in the areas where it mattered most.