IEEE Brainwaves

IEEE Brainwaves Newsletter is published by the IEEE Brainwaves student chapter of D.J. Sanghvi College of Engineering

IEEE Brainwaves Feature Events :

Industry Visit to Endress Hauser

Endress Hauser IV: The students that are members of IEEE strive to provide various programs as part of Continuous Improvement program and Academic- Industry interaction. Our aim is to give the students exposure to current best practices in the industry. Endress+Hauser Wetzer a German company, one of the leading producers of temperature measurement, temperature engineered solutions and system products worldwide. It began with the students being briefed about everything related to the company and the activities at the Aurangabad factory. They were then taken for a round of the factory in which each of the manufacturing process was shown to them and explained as to why and how the process is carried out. This was a very interactive and interesting session and the students asked various questions to the experts which were catered to very well. This session generated a lot of interest in the students related to the manufacturing field. Following this there was an orientation given to the students regarding the work culture, ethics, beliefs, objectives,

achievements etc of the company. The seminar was regarding the 5S and kaizen, a Japanese business philosophy of continuous improvement of working practices, personal efficiency, etc. A 5 S program focuses on having visual order, organisation, cleanliness and standardisation. The IV was open for all interested IEEE MEMBERS. 27 IEEE members visited accompanied by the faculty members Prof. Mayur Parulekar and Prof. Vivek Nar.

IEEE Spectrum Article :

Smart Neural Stimulators Listen to the BodyInnovative Direct-Current Microgrids to Solve India's Power Woes

Solar DC microgrids could do for electrification what mobile phones did for telephony

Illustration 1: Since 2015, the author's group at the Indian Institute of Technology (IIT) Madras has been working with the utility company and industry partners to electrify about 4,000 homes in 71 villages throughout the state of Rajasthan.

In the industrialized world, the power grid is so reliable that we take it for granted. But in India, where blackouts are a sad fact of daily life, being connected to the grid is no guarantee of reliable electricity. In a 2015 study of villages in six Indian states[PDF], for example, the vast majority reported having fewer than 4 hours of electricity per day; nearly half of the households that reported having a grid connection nevertheless had effectively no electricity. Chief among the reasons they

cited were poor reliability, quality, and affordability. In many parts of the country, even middle-income households still find themselves held hostage to frequent power cuts that can last anywhere from a few hours a day to most of the day. Those who can afford to often install diesel generators, an expensive and polluting option.

Then, too, roughly a quarter of a billion Indians, or one-fifth of the population, live without access to any electricity at all, according to the International Energy Agency. For a country where science and technology has otherwise advanced at a breathtaking pace, this sorry state of electrification is a disgrace.

In recent years, the Indian government has invested heavily in electricity generation (including solar- and wind-power plants), state-of-the-art high-voltage transmission lines, and a multitude of household electrification projects. And yet these efforts have made only a modest dent in the problem. A government Web portal that tracks rural electrification efforts shows that in only four of the country's 29 states do all of the households have access to electricity.

The problem is this: The Indian government has taken a traditional approach to electrification, which focuses on building up generation, transmission, and distribution. But there's a better way that's more affordable, more efficient, and much faster and easier to deploy. It can also address all aspects of the electrification problem at once, reducing the gap between demand and supply, bringing down electricity costs, and providing reliable, always available electricity to everyone.

This strategy, developed by my group at the Indian Institute of Technology (IIT) Madras in conjunction with industrial partners, relies on solar-powered direct-current (DC) microgrids. For homes not connected to the grid, a 125-watt microgrid can serve as the sole source of electricity. For connected households, the microgrid acts as a backup power supply to let lighting, fans, TV sets, and cellphone chargers continue operating even during brownouts.

In 2014, we began field-testing our DC microgrid systems in dozens of homes, offices, and dormitories at IIT Madras. The following year, we expanded deployments to about a thousand homes in three cities and multiple villages. Now, with funding from India's Ministry of Power, we have two large-scale projects under way that will eventually reach more than 100,000 households.

By Western standards, the 125-W load provided by our microgrids is quite modest—an ordinary household vacuum cleaner uses anywhere from 500 to 3,000 W. Indeed, in the typical northern California home, the "idle" load [PDF]—that is, the electricity used by devices that are plugged in but turned off—far exceeds 125 W. And yet, in every place we've deployed our system, the recipients have been immensely satisfied because they now have electricity around the clock. They appreciate having lights to prepare a meal or study at night, watching an entire TV program without having it interrupted by a power outage, sleeping through a hot night under the cooling breeze of a fan.

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