

Husk Power Systems

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Husk Power Systems is a startup company based in Bihar, India, that provides power to thousands of rural Indians using proprietary technology that has been developed by the firm that cost-effectively generates electricity using a biomass gasifier that creates fuel from rice husks, a waste product of the rice hullers that separate the husks as chaff from the rice, a staple food in the region. The company was co-founded by Gyanesh Pandey, Manoj Sinha, and Ratnesh Yadav, and the Chairman of the Board is Brad Mattson.

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Need

According to a study published in September 2010 by the International Energy Agency, 1.4 billion people worldwide have no access to electricity, including 400 million people in India, the country with the largest population of unserved people.^[1] Millions of people die each year as a result of indoor air pollution caused by the combustion of traditional fuels used for cooking, heat

and light.^[2] Among the population in India without electricity are the residents of 125,000 villages that have no power accessible to them. 80 million of those without electricity reside in India's poorest state, Bihar, where 85% of the state's residents are not connected to the electric grid and those who are connected often receive erratic service due to the lack of generating capacity.^[2]

Concept

CEO Gyanesh Pandey, an electrical engineer who graduated from Indian Institute of Technology (BHU) Varanasi and then earned a master's at Rensselaer Polytechnic Institute, left a job in the United States and returned to India. There he worked with Ratnesh Yadav on business ideas to serve the needs of the poor in India, with their initial unsuccessful ideas including the development of solar-powered lights and the use of jatropha seeds to create biodiesel fuel. After a chance meeting with a gasifier salesman, the two conceived of using rice husks, the unused detritus of the rice hulling process, as an input source.^[3] Estimates are that 1.8 billion kilograms (4 billion pounds) of rice husks are left over from rice processing in Bihar each year and almost all of it had previously been used unproductively as there had been no uses identified for it. Pandey focused on the development of the circuitry that would allow the systems to most efficiently generate power, working with the Ministry of New and Renewable Energy to optimize the gasifier to use rice husks alone, then using the output of the gasifier to fuel a generator and assembling a crude local power distribution network that they built for the village of Tamkuha, which went live in August 2007.^[2]

Application

Most of the units developed by the company generate 32 kilowatts of electricity from 50 kilograms (110 lb) of husks per hour, enough to provide the basic needs of a village of about 500, though there are several systems with higher generating capacity. The rice husks used to fuel the process are

purchased from local rice mills for under one rupee per kilogram.^[4] The cost of the service is about 80 rupees (less than US\$2) per month, about half the cost of the kerosene that most villagers use to power lamps that provide far less light than the CFL bulbs distributed by the company.

Local residents are employed to feed rice husks into the converter, to collect payments in advance and to monitor the electricity usage by customers, who are typically allocated enough electricity to each home for several hours each evening to power two 15-watt compact fluorescent lamps (CFLs) and to recharge their cell phones. Additional power could be purchased to power appliances that used more power than the basic allotment.^[2]

Impact

Each plant serves around 400 households, saving approximately 42,000 liters of kerosene and 18,000 liters of diesel per year, significantly reducing indoor air pollution and improving health conditions in rural areas.^[5] Village life can go beyond daylight hours with Husk Power Systems. Businesses can now stay open later which promotes economic development. Students can also use the electricity generated to study into the night. Each plant provides jobs for locals which creates opportunities to local farmers and entrepreneurs.^[5]

Finance

The company has worked to simplify the units and make them more resource efficient. Charred rice husks and ash, largely consisting of silica, is removed from the system using a hand-operated crank. It can be used for fertilizer or to make cement blocks, as well as being the raw material to create incense sticks.^[6] Agents hired by the firm to collect payments from customers for electricity also sell CFL bulbs, as well as other home staples that help add to their bottom line. To increase the efficiency of collecting funds, the company is developing a smart card reader that would cost about \$7 per home.^[2]

Two other members of the team, Charles "Chip" Ransler and Manoj Sinha, students at the Darden Graduate School of Business Administration at the University of Virginia, developed a business plan that earned \$60,000 from social innovation competitions sponsored by Darden and by the University of Texas.^[7] In 2009, the company won an inaugural global business plan competition sponsored by venture capital firm Draper Fisher Jurvetson and Cisco Systems and will receive a \$250,000 investment from the two firms to help improve the basic technology that the firm has already developed. The company has since received two rounds of financing from the Shell Foundation.^[2]

Service areas

As of 2011, Husk Power Systems serves 150,000 people through its 60 systems in villages in India's states of Bihar, Tamil Nadu and West Bengal, using "mini power-plants" that each generate 35 to 100 kilowatts of power, providing up to eight hours of power, primarily during the evening hours when illumination is needed.^{[8][9]} An additional two power units are expected to be added each week in 2011, with the company targeting to have 200 units installed by the end of 2011 and a total of over 2,000 units up and running by the end of 2014.^[2] HPS is also looking into developing a training program that would help foster the skills needed to expand the market and to offer a franchising method, whereby local entrepreneurs would operate systems built by the company. The company is also planning to expand to other countries in Southeast Asia and Africa, where the combination of power shortages in rural areas and available rice husks make the generating systems an effective solution.^[8]

See also

- Electricity sector in India
- Renewable energy in India
- Biofuels by region

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External links

- Company website (<http://www.huskpowersystems.com/>)

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