

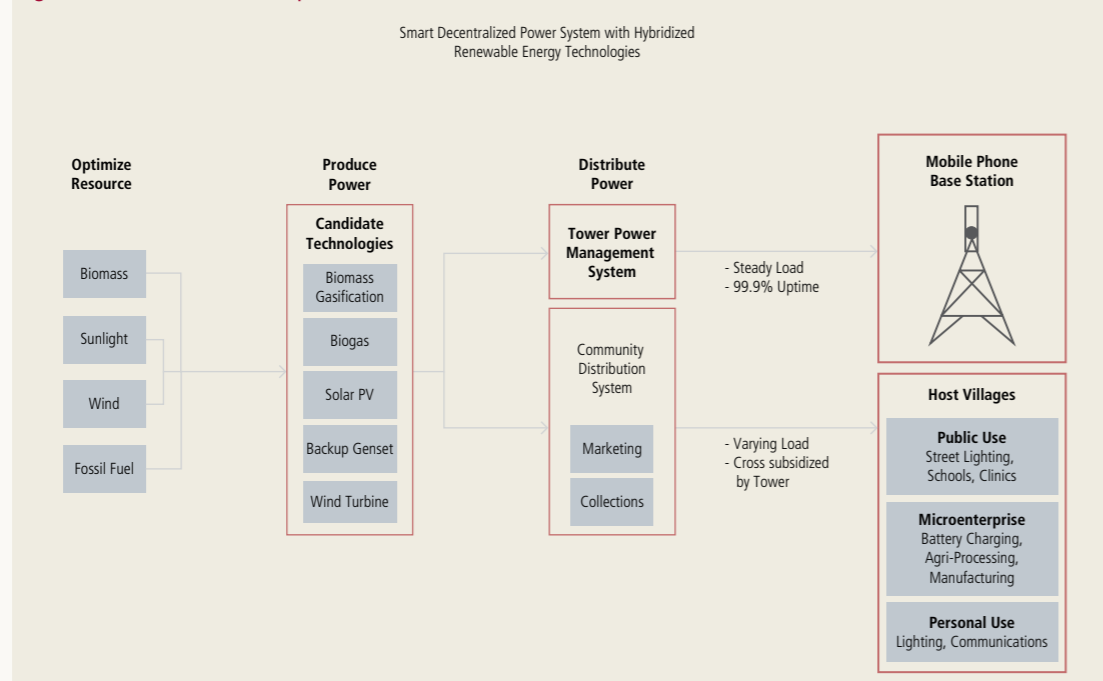
The Rockefeller Foundation’s SPEED Project in India

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Smart Power for Environmentally and Economically Sound Development (SPEED) is an initiative of the Rockefeller Foundation that was initiated in 2008-09 through a consortium of partners: Decentralised Energy Systems India Private Ltd (DESI Power - an India based rural electrification organization), Cleanstar Energy (an organisation involved in sustainable bio-fuels production and distribution) and the Confederation of Indian Industry’s Green Business Centre (CII-GBC).

The SPEED project aims to address the needs of approximately one-third of the world’s population that do not have access to electricity. SPEED will identify business models and support scalable demonstration pilots of off-grid renewable energy generation and distribution systems that harness the power demand of mobile phone infrastructure and other local enterprises to provide electricity services and spur economic growth in rural communities. The mobile phone towers will provide anchor demand for power generated by rural power plants, thus increasing their commercial viability so that they can generate and distribute affordable power to rural communities. SPEED will initially focus on India where 400 million people remain without electricity, with the goal to expand to other geographic regions, particularly in sub-Saharan Africa.

Figure 15: SPEED Model Description



Source: SPEED

The SPEED project’s strategic action agenda is to: Build an enabling environment that encompasses a broad range of stakeholders, including mobile phone industry, government ministries, private investors, local entrepreneurs, bilateral and multilateral institutions, technology enterprises, local business schools, research institutes and civil society organisations.

Mobilise financing for the ESCOs so that there is a significant flow of commercial, government, and donor funding for these projects.

Case Study in Baharbari - Bharti Infratel and DESI Power

In 2001, DESI Power identified the rural Bihar region and the powerless Baharbari village in Baharbari district as a potential site for a 50 kW power station, based on gasification of rice husk briquettes. The 50 kW plant was later upgraded to 61 kW. The raw material was available in abundance in neighbouring villages.

Figure 16: DESI Power Gasifier



By 2004, villagers could access electricity in their household for a fixed monthly rental fee. According to DESI Power’s concept of “EmPower Partnerships for rural development”, the access to power also benefited micro-enterprises and led to local value addition, agro-processing industries, and increased agricultural productivity. These micro-industries and the power plant generated regular jobs and additional farm income which in turn increased purchasing power for electricity, energy services, drinking water, health services and education. Following the success of its first power plant in Baharbari, DESI setup a second similar gasifier based power plant of capacity 61 kW in Vebhra village in Araria district, followed by two more gasifier power plants of capacity 75 kW in Gayari village and Zero Mile area of Araria district in 2008.

Despite the success of DESI Power in creating a thriving local economy in the Araria district by setting up multiple power plants that use locally available feedstock, achieving commercial returns from the operation of these power plants was still a challenge. Hence, DESI Power became a part of the Rockefeller Foundation-led SPEED project to increase the financial viability of its power plants by powering local telecom towers, adding a strong anchor load customer to the power plants. The SPEED project team conducted a market research and developed business models for this purpose, following it up with their first set of pilots which involved connecting the existing 4 DESI power plants in Araria to telecom towers. The process of connecting DESI’s power plants to these telecom towers began in June 2010 and the current status (as of March 2011) is as shown in the table below:

Table 10: Current Status of Telecom Tower Connections for the SPEED project

SI No.	Place	Tower Name Owner	Tenant	Infrastructure Provider	Load from Telecom Tower (kW)	Remarks
1	Jokihat	Bharti Infratel	Tata Indicom	Bharti Infratel	10	Due to single phase issue, it is decided jointly not to connect this tower. Bharti has identified a new tower
2	Jokihat	Vodafone	IDEA	Vodafone	6	Connected
3	Jokihat	Tata Docomo		Tower Vision	5	Cable laid but not connected. DESI is waiting for the confirmation from Tower Vision, Technically OK.
4	Gaiyari 1	Tata Indicom		VIOM Networks	6	Cable laid, DESI is waiting for the confirmation from Tower Vision. Technically OK
5	Gaiyari 1	Vodafone		Vodafone	6	Cable laid, Vodafone has agreed but some local issues need to be sorted out
6	Zero Mile, Araria	Vodafone	IDEA+Tata Docomo	Vodafone	6	Connected
7	Zero Mile, Araria	Bharti Infratel		Bharti Infratel	4	Connected

Source: DESI

Figure 17: Local Entrepreneurs in Gaiyari



DESI Power's 75 kWh biomass gasifier based power plant in Gaiyari is currently supplying power to a Bharti Infratel tower and a Vodafone-owned tower which is shared by Vodafone, Idea Cellular and Tata Docomo equipment. However, the difference in load provided by telecom towers and other consumers is due to the fact that telecom towers provide a continuous load to the DESI power plant for 6-7 hours everyday (when the power plant runs) whereas power is supplied to other consumer based on their need as all the consumers may not be using power all the time.

Being connected directly to the DESI Power gasifier plant, allows the mobile operators to reduce their overall operational expenses. In the case of the Bharti Infratel owned tower in Gaiyari, this operational expense saving has been quantified in terms of reduction of diesel generator (DG) run-time per day. This saving in number of DG running hours translates into 1.8 litres per every hour of DG run-time at the Bharti Infratel site¹².

Table 11: Reduction in Diesel Generator Use from the Use of DESI Power Plant

Diesel Generator Run Time per day BEFORE connecting to DESI Power's gasifier plant)	Diesel Generator Run Time per day AFTER connecting to DESI Power's gasifier plant)
22.8 hours per day	17.8 hours per day

Source: Bharti Infratel

12. The Bharti Infratel tower is a Ground-based Tower (GBT) which is shared by two base station equipment (including one from Bharti Airtel) and both the equipment are outdoor base station type (hence they don't require air-conditioning, which reduces their overall power requirement).

Regulatory Environment

For all its four existing gasifier power plants, DESI Power has not faced any regulatory issues around power distribution licensing since it operates the plant as a captive power plant which is part-owned by the local community which buys power from the plant. Ministry of New and Renewable Energy (MNRE), Government of India and the Bihar State Government have both confirmed that in rural and off-grid areas, supplying power to any consumers within a 3 km radius doesn't require any distribution licensing.

Social, Environmental and Climate Change Benefits

The business enterprises yield considerable social and environmental benefits through reducing air pollution from diesel engines, creating rural jobs by adding value to local, renewable resources, and increasing the GDP of the village by keeping most electricity revenues within the local economy. Other benefits include health, access to information and communication technology (ICT) and financial services, and enhanced water and food security. Furthermore, the increased prosperity of rural populations enhances their social, economic and political participation in the democratic process. The entire array of social and economic benefits of typical business enterprises in villages encompasses those that are easily quantifiable—such as total employment, number of jobs for women, increases in income and local GDP—those where new measurement metrics are required, and those that resist quantification.

Next Steps

Since the launch of the SPEED project at the end of 2009, more stakeholders have expressed interest in joining this initiative. The SPEED project's strategic action agenda is to establish 7-8 clusters of up to 50 village-level decentralised renewable energy units that test a diversity of commercially scalable models across different renewable energy technologies and geographical conditions by the end of 2013.

The goal is to demonstrate the sustainability of the model and create verifiable conditions for its scaling up. SPEED will also continue to promote favourable policies and regulation, engage critical industry players, create financial models and promote increased channels for affordable technology dissemination.

Telecom tower companies such as Bharti Infratel are interested in continuing to work with DESI Power on similar projects since it can reduce their operational expenses as well as assist them in enabling the local community to access DESI's power at lower costs than before.