



DESI Power™

EmPowering Rural India

Who We Are

Decentralised Energy Systems India Pvt. Ltd. (D.E.S.I. Power™) is focused on creating an empowered rural India where green energy is a means to achieve economic development of the region. The mission of DESI Power is to promote the reduction of endemic rural poverty through local job creation driven by electricity generation from power plants based on local resources of renewable energy for local micro-enterprises, businesses and energy services for lighting, pumping for irrigation, modern biomass based cooking fuels, drinking water, cold storage, etc.



DESI Power was founded in 1996 by an outstanding technocrat Dr. H.N.Sharan, who is a world renowned energy expert, together with Dr. Ashok Khosla, Founder of Development Alternatives, New Delhi and an internationally reputed environmentalist. Dr. Sharan has been working in the Power and Energy Sectors in Switzerland and India at the highest management levels during the last 60 years. His experience covers fossil and renewable energy technologies (Biomass, PV, solar thermal power plants, financing and CDM), and energy systems in industrialised and developing countries. He is Chairperson of DESI Power.

What we do

DESI Power builds and operates decentralised electric power plants using renewable sources such as biomass, biogas, bio-fuel and solar. It also establishes the rural infrastructure for access to electricity and economic development around it. They include:

Power Plants for Electricity Generation:

1. Conduct site surveys including assessment of renewable energy sources, energy needs and load surveys, prepare DPRs for integrating supply and demand sides.
2. Set-up biomass, biogas and PV power plants, either on their own or in an hybrid combination. Undertake O&M of the power plant.



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3. Provide EPC and O&M services for power plants, mini-grids, energy services and micro-enterprises.
4. Promote energy plantations and organise biomass management such as procurement, processing and preparation.
5. Provide training and capacity building as well as refresher courses at its DESI MANTRA Centre.

Energy services including Micro/Mini Grids for Electricity Distribution:

1. Set-up mini- and micro-grids to deliver power to the customers, including telecom towers.
2. Electrical distribution system and management.
3. Provide suitable renewable energy solution for power need of the village.
4. Clean cooking energy solutions.
5. Drinking and irrigation water solutions to the farmers and villagers.
6. Sell lighting solution for households, vendors and shops.
7. Collect revenue in the villages for the power plant and MEs.



Training, Capacity Building, Developing Microenterprises:

1. Mobilisation and formation of village cooperative/society who will ultimate manage village programs.
2. Assistance in packaging (including information on subsidies, CERs, loans etc) of power plant and micro enterprises
3. Development of new micro enterprises in the villages
4. Training and capacity building – training the workforce not only to run its own operations but also to support other enterprises in the ecosystem.
5. Project management.



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Thus, the solutions provided by DESI Power create an integrated solution for the economic development of the village.

Our Achievements:

The company has vast experience in operation and maintenance of biomass power plants for over a decade and half and has operated biomass plants for many thousand hours under various conditions and applications. The company has formed several partnerships to strengthen its capability – a joint venture with BEAS has been created to establish an EPCOM (Engineering, Procurement, Construction, Operation & Maintenance). Similarly, experts from solar fields have been brought in to create solar PV and thermal solutions for power and heating needs of the villages. The following are some of the significant milestones achieved by DESI Power over the past one and a half decade:

1. **Formation of village organisation:** Establishing partnership models and organisational structures for the full management responsibilities by villagers. DESI Power has worked closely with the villagers and formed cooperative and society in various villages who work as a local partner of DESI Power. Local partner role is very important as they take responsibility of organising biomass, helping in revenue collection etc.



2. **Setting up small biomass power plants and O&M of the plant:** DESI Power has worked over the years to make biomass gasification systems suitable for reliable operation and management by locally trained village staff. DESI Power has setup various biomass power plants for various applications and operated them on continuous basis, with dual fuel as well as pure gas engines. DESI Power has given a big contribution in commercialising of biomass power plant. A list of all these plants is provided in the table at the end.

3. **Electrical distribution (micro-grid) system:** DESI Power at present operating 4 power plants in Bihar. These plants are supplying power to the local micro enterprises, mobile towers, households and market lighting. DESI Power has laid underground cable for providing electricity supply to various consumers. The underground cable ensures more security and safety. The mini-grid in Baharbari & BARA villages where all households are connected by underground cable and each house has a sealed box and MCB, which ensures to tackle any fault in the line.



4. **Training and capacity building:** DESI Power runs DESI MANTRA which has trained staffs for office and plant purpose. DESI MANTRA also has trained some of partner's operators on O&M of the plant.



On site technical training of trainees at Galyari site

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5. **Revenue collection:** DESI Power has different models for revenue collections, for example, for the mini-grid it is a daily bill collection – gives flexibility to the consumers; for certain MEs also we collect daily revenue; other MEs and Telecom tower – bill is collected on monthly basis. This system is running smoothly.
6. **“SPEED” Program supported by Rockefeller Foundation to Integrate Mobile Towers in Village Projects:** Over 10 mobile towers have been connected from its existing 3 biomass power plants in Araria. The goal is to take nearby mobile towers as a base load and provide power to the villages. DESI Power plans to build 20 more such decentralised systems over the next two years.
7. **Micro-enterprise and Job Creation:** Additional jobs have been created and the income of small farmers increased by timely supply of irrigation water and growing of energy plants. A large number of non-agricultural jobs have been created through traditional and new micro-enterprises by establishing profitable new local businesses for energy and water services, lighting, bio-businesses, fishery, etc.



Our Expansion Plans:

Banking on its vast experience over the past decade and half, DESI power is on its way to develop solutions based on biomass, biogas, solar PV and their hybrids optimised for local conditions:

1. **Lighting:** Starting a solar lighting business based on state-of-the-art LED lights. The LED lamps will be charged by biomass power plants if the exist in the village or by PV charging stations set up in the villages.
2. **Renewable Hybrid Micro Grid:** Solutions for creating local grids of 440V / 220V systems for villages to serve hamlets, farming, factories and telecom towers, using combination of decentralised biomass and biogas plants and solar PV.
3. **Installing Power System Management Module in every village** with Intelligent controls and smart meters and remote monitoring to manage the demand side fluctuations and optimise generation costs with multiple generators.

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4. **Biogas plants:** Biogas plants are ideal sources of clean energy and fertiliser for villages with agrarian economy such as Bihar's. The feed stock - cow dung, water hyacinth and other green biomass are available in plenty and biogas plants can be promoted as rural enterprises either as a part of dairy farms or as separate entities for supplying clean cooking gas and/or electricity and/or electricity, process heat and cooling from Combined Cooling and Heating Plants (CCHP). The biogas plants will also produce high quality fertiliser which will be sold to the local farmers. Biogas can thus become one of the major renewable energy technologies to transform the economy of villages in North Bihar and they will be promoted by DESI Power as a part of its EmPower Partnership Program and other entrepreneurs and promoters. Commercialisation of biogas plant will start very soon.
5. **Clean Cooking energy:** The aim of the project is to provide clean and affordable cooking energy solution in villages. A business unit (Clean Cooking Business Unit) has been set up along with its village partners to produce pellets from locally available biomass residues and supply them for use in fuel efficient and smoke free Energy Efficient Stoves (EES)..
6. **Cold storage and drying:** A total energy system is being developed jointly with equipment suppliers to optimise the utilisation of the waste heat from engines to run cold storage plants and dryers.
7. **Mobile Water pump:** DESI Power's goal is to optimise, commercialise and promote a range of small mobile pumps using a local renewable energy source which can replace the existing mobile diesel driven pumps being used for irrigating small plots with lift irrigation in villages in Araria district.
8. **Energy Plantation:** DESI Power plans to set-up energy plantations in all EmPower project villages to ensure security of biomass supply at fair prices. The first one has been set up in Baharbari village with fast growing trees like Bamboo, Ipomea, Kadam, Su-Babool and other local plants. DESI Power is well aware of the issue of food versus fuel which will be taken into account by using mostly non-agriculture land for the energy plantation and suitable inter-cropping with vegetables and spices planted in between energy plants.

Awards and recognition:

- DESI Power was declared a winner at the World Bank Global Development Marketplace Competition 2006 in Washington with a prize of US\$ 200,000
- DESI Power was one of the global winners of The Tech Museum Award 2008 with a prize of US\$ 50,000.

We consider these awards as recognition of the role that decentralised power supply and energy services are destined to play in removing poverty from the rural areas of the Third World.



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Reference List Power Plants of DESI Power

Sl. No.	Location	Year of Commissioning	Gasifier Rating Kg/h	Engine Rating kWe	Remarks
1	DESI Power Orchha (P) Ltd, M.P.	1996 Gas engine 2004	120	1 x 50 DF 1 x 50 PG	It is first plant of DESI Power and operative since last 14 years. Has completed about 40,000 hrs of operation.
2	DESI Power Mahanadi, Orissa	2001	120	36 DF	This plant was built for village water pumping in Orissa when free power became available. The plant was shifted to other location
3	DESI Power Baharbari, Bihar	2001 / 2008	65	1 x 24 DF 1 x 11 PG	First plant of Bihar, installed in an interior village of Araria. Power plant is managed by DPK and the local cooperative BOVS provides energy services to the villagers. A mini-grid has been to supply power to all households in the village.
4	M. Vishveswaraiah Institute of Technology (MVIT – I), Bangalore	2002	135	2 x 50 DF	These plants were operated in Dual fuel mode to supply uninterrupted power to the college for 3-1/2 years (over 21000 hours of operation). Due to rising diesel price generation was no longer economical and the plant has been shut down.
5	MVIT-II, Bangalore	2002	135	120 DF	
6	WSD / Datia, DA	2002 / 2006	65	50 DF	This plant is used for village application (water pumping and other MEs)
7	G. B. Engineering Enterprises, Tamil Nadu	2002	135	2 x 50 DF	These two plants were installed by DESI Power as pilots for Industrial application. Plants were tested and operated but due to low load demand the plants were not regularly operative. Both plants shifted to Gaiyari 1 & 2.
8	G. B Food Oils, Tamil Nadu	2002	135	120 DF	
9	Vellore Institute of Technology, Tamil Nadu	2002	135	112 DF	Another plant in an educational institution. It is in regular operation.
10	Assembo Bay Project, Kenya	2002	65	1 x 50 DF	This plant was sent to an NGO for a village in Kenya.
11	Gaiyari 1, DESI Power, Bihar	2008	100	75 PG	Two (CDM) plants installed at a village to supply power to existing

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12	Gaiyari 2, DESI Power, Bihar	2008	100	75 PG	micro industries. Telecom towers being connected to the plant.
13	Bhebhra, DESI Power, Bihar	2009	100	32 PG 1 x 11 PG	Plant supplying power to the nearby enterprises and evening lighting. Telecom towers being connected to the plant
14	DESI Power Baharbari, Bihar	2009	20	11 PG	Small gasification plant with PG engine for starting without diesel oil and for load management.
15	Bhebhra, DESI Power, Bihar	2009	20	11 PG	Small gasification plant with PG engine for starting without diesel oil and for load management.
16	BARA, DESI Power – Minda Partnership, Bihar	2012	50	32 PG	DESI Power and Minda NextGen have agreed to work in partnership for jointly setting up biomass power plants. Under the agreement first joint plant of 32kWe is setup.

DF = Dual fuel, PG = Pure gas