Gram Oorja Solutions Private Limited



September 2014

Executive Summary



- Problem Millions of rural households, farmers, institutions and businesses in India suffer from little / poor quality / no access to reliable modern sources of energy
- This problem can be mitigated using local renewable energy sources with long term sustainability
- Earlier attempts have mainly addressed lighting, the rural aspirations go far beyond
- The Government has allocated funding, policy issues are still being resolved
- CSR initiatives will help in pointing the way and in creating examples
- Gram Oorja Solutions Private Limited, estd. 2008, acts as a catalyst in commercializing on-the-ground viable Renewable Energy solutions with focus on the rural sector
- Gram Oorja specialises in micro-grids for Remote Village Electrification, project implementation in solar and biogas, Electricity as a Service (ESCO) and consulting for rural energy projects.
- Gram Oorja works with well established NGOs in areas of their operation to facilitate the above



Electricity in parts of rural India has the following characteristics:

• Village electrified but very poor supply

Many villages have only 5-6 hrs of electricity supply per day

• Village electrified but very few households connected

As per Census 2011, rural household electrification level stands at a dismal 54% About 75 M rural households do not have access to electricity

• Village un-electrified

Many villages are located in remote / inaccessible areas, which increases the cost of installing a grid or are not permitted to be connected to the grid by law Population in these villages have little or no access to modern sources of energy

Gram Oorja implements projects to mitigate the above problems

About Gram Oorja



- We are Gram Oorja Solutions Private Limited, established in April 2008.
- We act as a catalyst in commercializing on-the-ground viable Renewable Energy solutions with focus on the rural sector.
- We specialise in micro-grids for Remote Village Electrification, project implementation in solar and biogas, Electricity as a Service (ESCO) and consulting for rural energy projects.
- Gram Oorja is well recognised and consulted by several government and nongovernment organisations in India and abroad including the Ministry of New and Renewable Energy, Centre for Science and Environment, Observer Research Foundation, Prayas Energy Group, Shakti Sustainable Energy Foundation, GIZ – a German initiative for international cooperation, UCL-Berkeley and Princeton University.
- We work closely with communities and well-established NGOs like Pragati Pratishthan and Sanjivani Seva Trust.





- Sameer Nair, Director, is an IIMB graduate with 18 years combined experience in rural electrification, banking, software and investment banking
- Anshuman Lath, Director, is an IIMB and IIT graduate with 17 years experience working in rural electrification, SMEs, tribal education organisations and investment banking
- **Prasad Kulkarni,** Technical head, is a M. Tech in Energy Systems and has 9 years experience in energy conservation and in rural electrification
- Sudhindra Nath Chatterjee, is an engineer with 31 years in the software industry. Has headed the CSR activities of a large multinational
- In addition, 6 member team comprising of project engineers. Team well versed in surveys, project design and on ground execution in remote rural locations
- Part time members include **Ganesh Shenoy** and **Ashutosh**, field experts with over 25 years each in the social sector





- Micro-grids for remote village electrification Darewadi in Maharashtra and Viral in North Karnataka.
- Project Implementation in solar and biogas solar pumps installed in 17 villages in Thane district, solar solutions installed in rural schools and other institutions, biogas plants implemented for ashrams (Tamil Nadu), dairies (Rajasthan) and restaurants (Maharashtra).
- Electricity as a Service Project implemented in rural Uttar Pradesh where we sell electricity from our power plant to a rural BPO.
- Consulting Demand assessment and policy inputs for rural energy solutions, surveys to determine status of established projects. Surveyed more than 150 villages across 7 states.

Energy is the enabler



- Education
 - Electrification of rural schools enables computer usage and science laboratories
- Health
 - Electrification of health centres allows them to use modern equipment and cold storage
 - Filtered drinking water plants to mitigate water borne diseases
 - Reduction in smoke related diseases due to firewood based cooking
- Entertainment and Communication
 - TVs and mobiles allow people to be connected



- Women empowerment
 - Cleaner and less cumbersome cooking systems with biogas
 - Saves time and energy for getting firewood and kerosene
 - Increases time for family and for productive cottage industries
- Livelihood generation
 - Irrigation for a second crop in many tribal areas
 - Milk chillers and other conversion of raw material into more remunerative products

Energy – Impact on rural lives



- Improvement in the quality of life
- Augmented income
- Improved agricultural productivity
- Lesser reasons to migrate to towns and cities
- In remotest areas, feeling included in the mainstream is important

Gram Oorja – Business role



Micro grid at Darewadi

- A small hamlet of 39 households (Population 220) located in Junnar taluka of Pune district
- Complete ownership of plant and micro grid by village energy committee (Vandev Gramodyog Nyas)
- 9.4 kWp solar micro grid in operation since July 2012
- Plant cost Rs.30 Lakhs
- Current collection from all beneficiaries is ~ Rs.5,500/- per month and increasing with realization of latent demand
- 7 TV sets, 2 computers, 2 water pumps and 1 flour mill in operation apart from basic lighting
- Local youth trained to maintain plant, generate bills and collect payments
- See ORFs take on Darewadi http://www.youtube.com/watch?v=X3PApE 6vY1w







Case study - Darewadi



Impact assessment

Before the installation

- There was no electricity available
- Kerosene was used for lighting
- No TVs and other appliances were used
- Lengthy walk was involved for grinding grain
- No water pumps for irrigation and households

After the solar grid installation

- 39 houses with metered high quality electricity no significant outage
- Average 3 LED lights per house
- 9 TVs with satellite dish connections
- 2 computers installed
- 1 grinding mill in operation
- 2 water pumps in operation
- Local youth trained and ready for scaling up elsewhere









Micro grids – the circle of success







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Thank You

Appendix



Case I (Gram Oorja initiated project) Gram Oorja will -

- Identify villages as part of a cluster
- Initiate social interaction
- Estimate demand (current and latent)
- Size the project and prepare DPR
- Identify potential fund sources
- Execute the project
- Train and maintain

Gram Oorja targets a margin of 15-20% of project cost Case II (Village is identified by the fund provider - Govt., CSR / NGO,Tech partner)

Gram Oorja will -

- Do the community mobilisation
- Execute the project
- Maintain it as contracted

Gram Oorja targets a margin of 10-15% of project cost

Gram Oorja - Recognition in the press

märkte

kurz notiert

Erweitertes AHK-Netz

In Baku ist die Deutsch-Aserbaidsc

nische Auslandshandelskammer ertill net worden. Basis der neuen AHK war der bereits 1999 gegründete Deutsch-

Aserbaidschanische Wetschaftsweband

IDAWF), der die Interessen der deut-schen Wirtschaft bündelte. Die AHK

histet inchesondere kleinen und mittle

Erschließung des jeweiligen Partner

Die Wirtschaft des ostafrikanischen Lar

des expandiert rasch. Besonders in der

in der Agranwirtschaft und Nahrungs-

Itelverarbeitung sind Partner au sutschland gefragt. Die Textil- und Be

kleidungsindustrie gewinnt immer meh

Kunden auch in Europa. Die Branche will bis 2016 rund 200 neue Textil- und Be-

kleidungsfabriken ansiedeln und dabei 1.6 Milliarden US-Dollar im

afrikanahost@gtai.de

hen Infrastruktur, Rohstoffe sowie

mehmen Unterstützung bei de

ren deutschen und aserbaidsch

ASERBAIDSCHAN



पुणे के दरेवाड़ी गाँव के लोगों की जागरुकता से आज उनके पास उनका खुद का बिजलीपर है उजाले के सपने को हकीकत में जीता एक गाँव

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भी के पहिलां में उनी बहैटलपुट में उनुभव अपने पर है, इस्तरिंग प्रथम को 4 को सितनी अब पुरु में पानी है और प्राप्त 4 को प्रकार का से तोनी है। इस प्रतिक्ष की कीत्रे-पीई कारणां इस्तरने के जिन्द अभित केयाहे और किस्तरी मोतने को प्रतिक्ष की पत्र है।



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Licht an

Elektrifizierung, Solarbetriebene Mininetze bringen Strom in abgelegene Siedlungen. Text: Katrin Pasvantis

ns Dorf Darewadi in Westindien be-taus nur 29 Lehmhäusern. Stra-spielsweise auch Bewässerungpumpen Kien und Stronnetz enden im drei betrieben werden. Indiens Bedarf an Kionneter enfernten Nachbardorf. Und netzunabhängigen Lösungen ist großdoch hat in Darewadi jeder einen Strom-Schätzungsweise 50.000 Dörfer haben anschluss. Seit Juli 2012 speist eine keinen Strom. Langfristig stellen Mini-Fotovoltaikanlage ein dorfeigenes Strom- netze eine kosteneffiziente und umweltnetz. Bosch Solar Energy stellte die Tech-nik; umgesetzt wurde das Projekt von dem in Pune ansässigen Unternehmen die Kosten für Fotovoltaiktechnik sinken, dem in Pune ansangen Onternenmen die Konten für Potovotakte Gram Oorja. Für Wartung, anfallende steigen die Rohstoffpreise. Kosten und die Geböhreneinnahme ist das Dorf selbst verantwortlich. Jeder

Haushalt zahlt seinen Verbrauch plus eine Kostenpauschale. Die Kapazität der -> WEITERE INFORMATIONEN Anlage reicht mit zehn Kilowatt für pri- Wilma Knipp, vate und betriebliche Zwecke. Neben asien/ägtai.de



Gram Ooria seeks to light up rural India

DNA / Partha Sarathi Biswas / Tuesday, December 18, 2012 12:41 IST

For IIM Bangalore alumni Sameer Nair and Anshuman Lath, Robert Frost's poem, The Road Not Taken has a special meaning: they conceived Gram Oorja Solutions Private Limited dedicated to electrification of villages in ndia using innovative solutions. The task before the company is of leviathan proportions as by a rough estimate, India has 50,000 villages without electricity.

While rural electrification has been talked about, the progress to conquer the rural darkness has been anything but fast. The mega schemes of the government, at times, have failed to deliver the desired results and Gram Oorja plans to take up the challenge using non-conventional sources of energy.

"Usage of renewable source of energy for generation of power in rural areas has been tried, but according to us, the major flaw in the past projects had to do with the fact that the villagers were not involved in the decisio making of the project," said Lath.

Both pointed out that in many places, it has been observed that the infrastructure out up for village electrification had stopped working due to technical snags or usage of substandard material.

The innovation devised by Gram Oorja consists of involving the villagers at the grass root level. Their plot project, for such a scheme, at Darewadi, a small vilage off the Pune-Nashk Road, was the laboratory for the same. In fact, the vilagem were involved from day one and the power plant, which lights up the vilage is owned, managed and run by a trust formed by the villagers. The project in Darewadi, runs on solar energy Along with Bosch, Gram Oorja installed a solar energy power plant, which is being run by the villagers now

"At times, some potential investors do back away from the plans as they feel it does not fit into their definition of charity. But, we firmly believe that till the time villagers are not directly involved in the process, the power plant would not be a success," said Nair.

At this moment, in the projects of village electrification, Gram Oorja, involves the backing of corporates for erection of the basic infrastructure. But the team of Gram Oorja, which also includes people like Sumeet Suta Kiran Auti, Prasad Kulkami, Shekar Lokhande and Priya Purwar believe that this project would become a working model in the near future.

Lath confided that next year they intend to take up the electrification of 75 villages and set up 10 minigrid Already talks are in the final phase for replication of the Darewadi project in a village in north Karnataka.





त्वसम्पनः विद्युव आगन्तुः तमा इम. स्वाप्तः परितु हः आमितिका स्विम भतः प्रदृष्य भः वर्त्तां भिगः स्वातः तेती अगि विद्यार्था वस्वते स्विम परित स्वा संपन्धते, तेवन्ते स्वी परित स्वा प्रदन् द्विति से स्वी व्योग्य विस्ताय स्वय दिवित केल स्वी.

Solar water pumping system

- Solar water pumping system for domestic and agriculture use
- Water delivering capacity in the range of 5,000 1,00,000 liters per day and max. head of 200 m
- Estimated cost: ~ Rs. 3.0 Lakh, it depends on location and water requirement, water storage and pipeline cost is not included
- Beneficiaries: Communities or hamlets lifting water for domestic use from a large distance, farmers which are using diesel pump sets for irrigation
- Geography: Anywhere across India
- Projects done: Different villages in Jawhar taluka, Agriculture Research Institute; both in Thane District, Maharashtra







Community biogas plant, piped gas network



- Community biogas plant based on cattle manure, food or agro waste (subject to availability) and piped gas distribution network
- Gas usage for cooking or process heating, gas pressure and cooking timings same as for LPG
- Biogas usage can be metered and tariff to the consumers which can take care of operations and maintenance
- Estimated cost: Rs. 12 15 Lakh for communities with 25 50 households
- Beneficiaries: Communities which are using firewood for cooking or communities facing difficulty in getting LPG cylinders may be because of remoteness, school refectory or mid-day meal in semi -urban or rural schools
- Geography: Anywhere across India
- Projects done: Piped gas network for community in Kolvan village, Pune district, Maharashtra





Solar PV systems for Educational Institutes



- Small solar PV systems (1 5 kWp) for running electrical load in schools, offices especially for running critical day time loads such as computers along with some lighting and fan load
- Estimated cost: Rs. 2.5 Lakh typically for 1 1.5 kWp system
- Beneficiaries: School computer labs, computer training centers, offices in rural areas etc.
- Geography: Anywhere across India
- Projects: Pragati Pratisthan (Jawhar, Thane), Sadhana Village (Mulshi, Pune), Ghatandevi Shikshan Prasarak Mandal (Igatpuri, Nashik), Keshav srushti (Uttan, Thane)





Solar PV systems for Health Care Centers



- Small solar PV systems (1 2 kWp) for running diagnostic equipment, small refrigerator for storage of medicine etc. in Primary Health centers
- Solar PV system (3 10 kWp) in Blood banks or Hospitals for running medical and health care equipment along with basic lighting, fan and computers
- Small solar PV systems (1 kWp) for running water purification unit
- Estimated cost: Rs. 2.5 Lakh for Primary Health Centers and for water purification unit, Rs. 6 20 Lakh for Blood banks or Hospitals depending on the requirement
- Beneficiaries: PHCs, Blood Banks, Hospitals in rural areas
- Geography: Anywhere across India

Associations



Grass-root organizations

- Pragati Pratishthan, Thane, Maharashtra
- Sanjeevani Seva Trust, Uttar Kannad, Karnataka

CSRs

- One of the largest trusts in India
- ARAI
- Rotary
- Some of the leading finance, manufacturing and IT companies