Contributing to India's Energy Independence in Micro and Macro capacities

KUVAM MICRO-GRID PRIVATE LIMITED

Centre for Science and Environment- Chattisgarh

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Background

Company Overview - Kuvam Micro-grid envisions to create access to clean, reliable and affordable electricity for people in rural and urban areas. Having very closely observed the development of different promotional mechanisms such as the Jawaharlal Nehru National Solar Mission and the Renewable Energy Credit mechanism as well as the changing trend of the component prices, Kuvam has been able to formalize a strategic approach towards the application of Solar Photo-Voltaic technology in India. Kuvam works in entire spectrum of power plants with experience in micro-grids, off-grid, and megawatt level solar plants. Kuvam has started its operations with micro-grids which is a high return and low risk model.

Kuvam has started its operations from West Champaran district of Bihar state in India where more than 400 households have been provided with a 24 hour electricity connection. The electricity has been generated through Solar energy and distributed through a micro-grid based on pre-paid metering model. Kuvam boasts of having 99% repayment rate by the consumers and 100% electricity theft elimination through its unique model. Kuvam's business model is one of the most profitable in solar industry with lowest establishment and maintenance cost.

Kuvam bring its strength from its highly diversified and experienced team having cumulative experience of more than 20 years in rural electrification, rural businesses, micro and macro financing, solar energy, logistics and supply chain, international liasioning, and serial entrepreneurship.

Vision and Mission

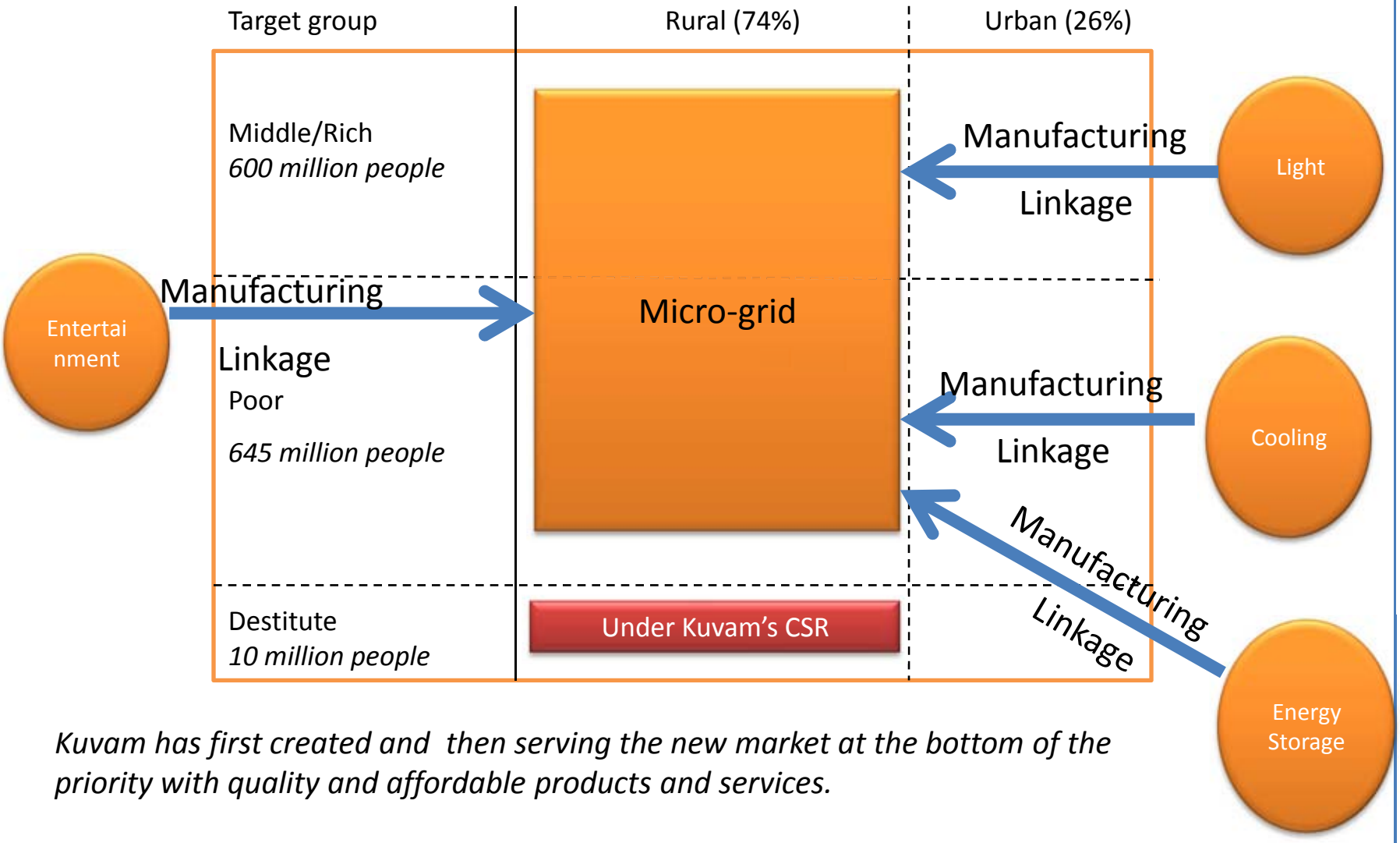
Our Vision

"To improve quality of life for rural India through the provision of electricity and energy efficient equipment solutions."

Our Mission

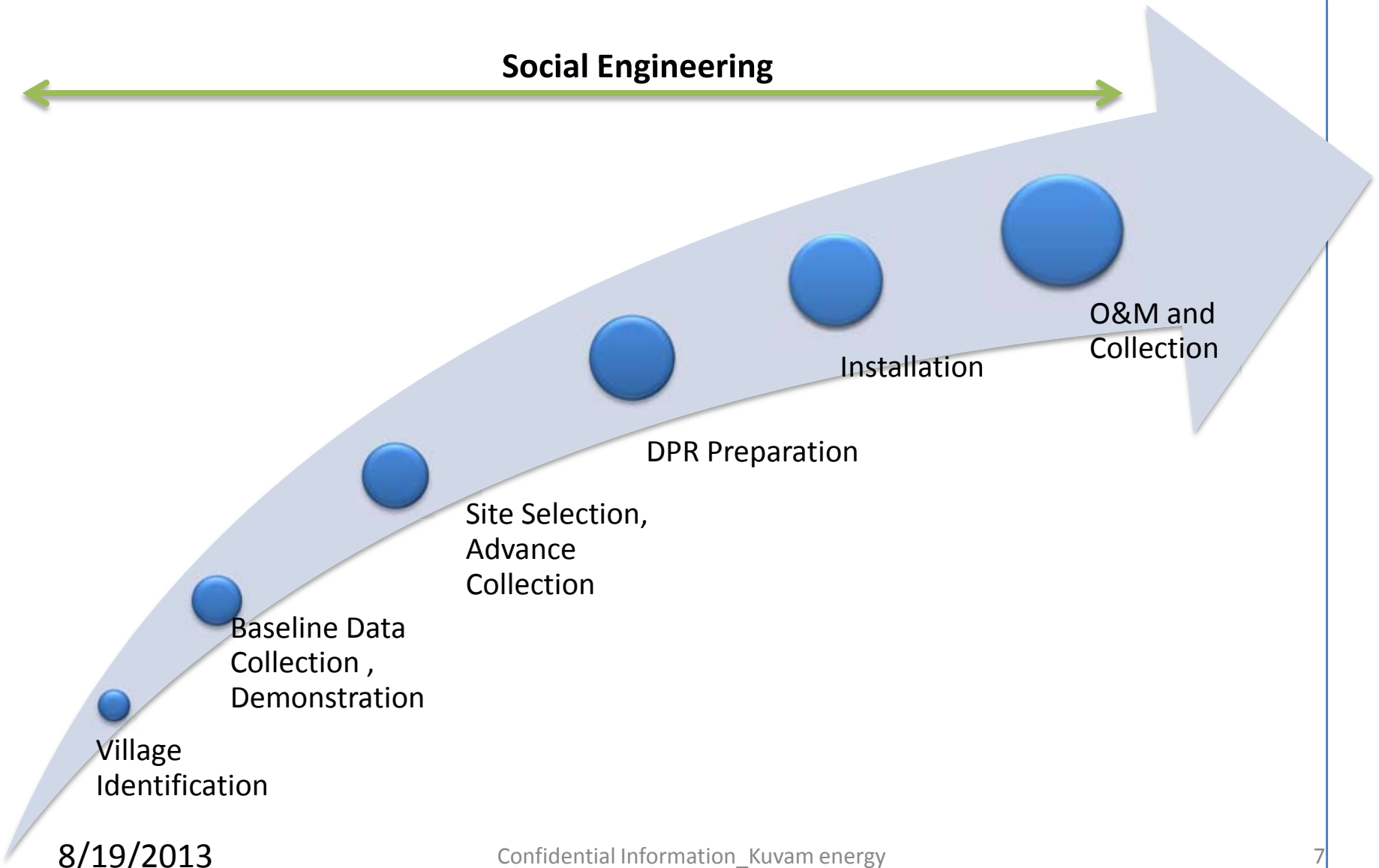
"To electrify 10 million people across India through micro-grids. Providing basic amenities to rural India through green electricity."

Kuvam's Target Customer's



Kuvam has first created and then serving the new market at the bottom of the priority with quality and affordable products and services.

Micro-grid Service Spectrum



Advantage - Kuvam

Advantage	Explanation
Superior technology and data management	Online portfolio monitoring and automated data collection and recording down to village level
Scalable and replicable operational model	Standardized operational processes to organization, project selection, and installation enables quick rollout and rapid expansion
Professional management	Staff and partners with extensive private sector experience in commercial, rural, and management consulting, and experience serving the poor through development and energy initiatives
Culture of innovation	Continuous innovation to provide flexible services and cost-effective scaling
Network	Kuvam ‘s management has extensive networking in Indian and overseas business and government environment

Current Project Location

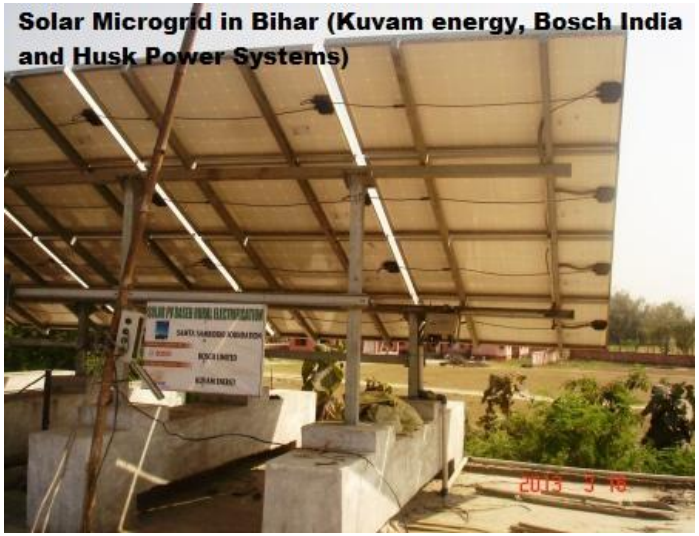
West Champaran
[Villages – 1483] [Population – 39,22,000]

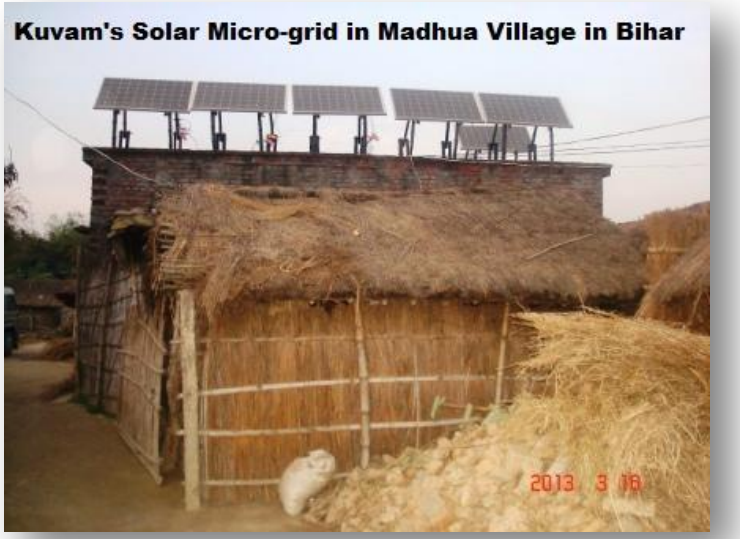
Village	Block	District	Households covered	Plant size [KWp]
Binahi	Bhitaha	West Champaran	150	3.12
Madhua	Madhubani	West Champaran	93	1.92
Ghaghwa Siswa	Madhubani	West Champaran	104	2.16
Bhagaunapur	Madhubani	West Champaran	40	0.96

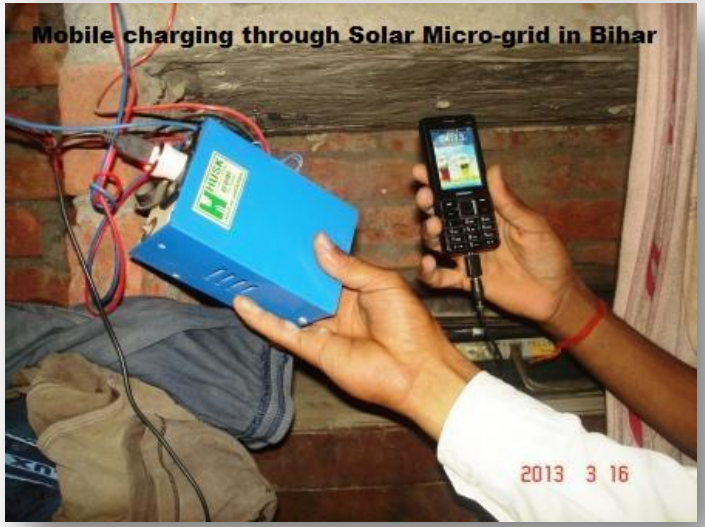
Project Pictures

Tailor shop lit by Kuvam's micro-grid in Bihar

Project Pictures



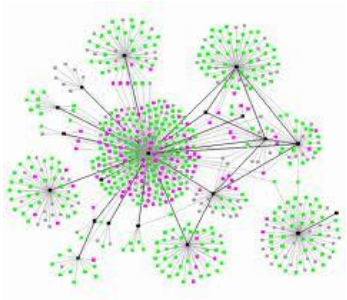




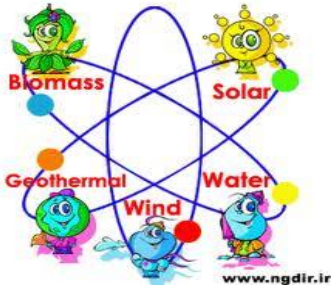
Part II – Micro-grid

- What is a Micro-grid ?
- Why Micro-grid ?
- Comparative Advantage of Micro-grids
- Why DC electricity Microgrid?
- Micro-grid Diagram
- Micro-grid Statistics
- Barriers
- ROI
- Lessons Learnt

What is a Micro-grid ?



Small networks



Local power generators

Local power distribution

Local Storage

Why Micro-grid ?

All current rural electrification models such as stand-alone product distribution, lantern charging stations, and classical thermal electricity models have failed to provide sustainable and reliable solutions.

Long term sustainability	Yes
Support to financial inclusion activities	Yes
Support to agricultural and allied activities	Yes
Micro enterprise promotion	Yes
Energy availability when needed	Yes
Reduction of talent migration from villages	Yes
Community involvement	Yes
Support to education	Yes
Support in enhancing medical services	Yes
Safety in environment	Yes
Increase in communication facilities	Yes

Comparative Advantage of Micro-grids

	Lanterns / Home Light System	Lantern Charging Station	Micro-grid
Affordability	One time high cost from Rs.2000 to to 14500	1 Lantern on rent for 4 Hours at Rs. 10 per day	2 Lights & Mobile charging cost Rs. 6.5 per day
Sustainability	Up to battery's life ie 1 year or maximum of 2 years .	Up to battery's life ie 1 year or maximum of 2 years	Battery life of 5 years with high power Li-Ion batteries
Scaling	User has to buy whole new lantern/system	User can take more than one lanterns on rent	Power can be increased depending on the requirement
Utility	Only Light	Only light & mobile charging	Beginning with light and go up to any application
Hassles	Movable component which make system difficult to manage	People have to go to charging station to take lantern on rent	Plug and Play, Hassle Free service

Why DC electricity microgrid?

Low cost

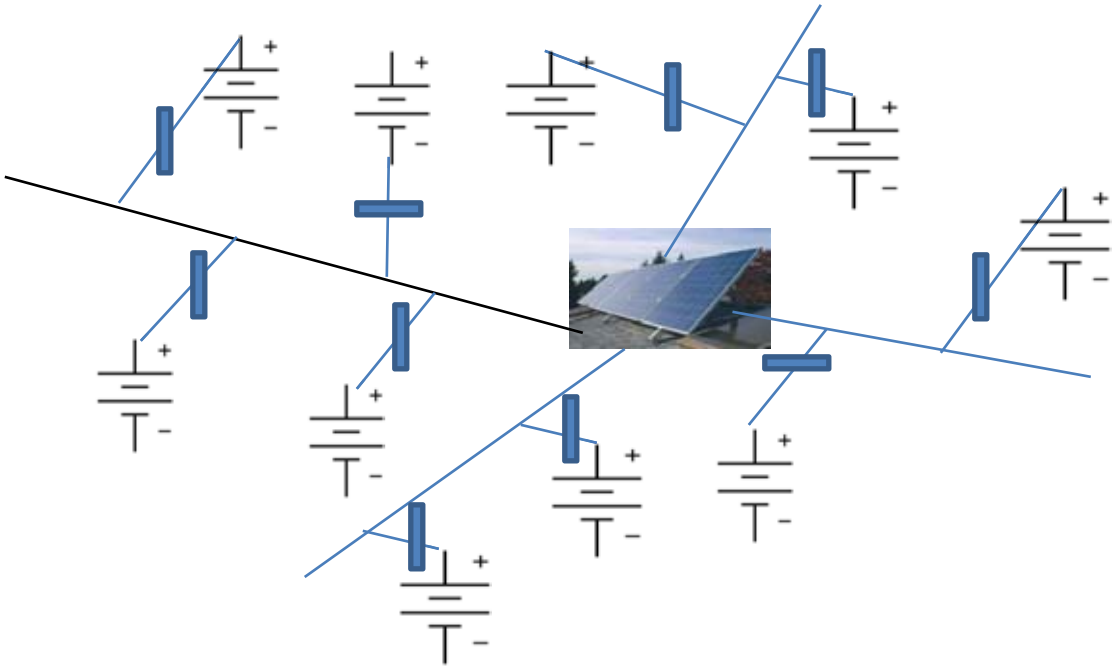
Easy to manage

Less repair and maintenance cost

DC appliances consumes 60% less energy than normal AC equipment

Excellent business model

Micro-grid Diagram



Charge Controller

Battery at homes

Distribution cables

Solar panel installed
on a roof-top in the village

Micro-grid Statistics

Number of Villages and hamlets	**1**
Number of households	12
Number of Light	24
W per light	2
Number of Phone charging	12
W per phone charging	1
Total consumption	60
No. of Hours of supply per day	8
Total kWh per day	0.48

Barriers for Micro-grids

- A constant need for subsidy due to high costs,
- A lack of interest by the private sector due to inherent investment risks, differences in consumer profile, rural energy end -use practice,
- A lack of meters and collections,
- A lack of institutional infrastructure,
- Political interference,
- Lack of consumer education and participation in electricity distribution,
- **Absence of successful business model**

How Kuvam is Overcoming the Barriers?

Infrastructure Development	Kuvam has chosen to create long term infrastructure in the villages as against dumping of products
Job Creation	Kuvam's strategy is to bring local brains and expertise to support their village development. This sense of ownership has helped Kuvam in strengthening its roots
Channelizing Products	Kuvam has invested in energy efficient product manufacturing so as to provide these products at affordable rates directly to the users. Pre-paid Meters, LED Lights, Low Wattage TV, No electricity Fridge, Li Ion battery are some of these products
Successful Business Model	Kuvam with its partners has implemented the only successful return based micro-grids in India. Our model does not depend on subsidy.
Social Engineering	Kuvam 's transparent processes, investment in education and health, no political influence has made our efforts successful

Return on Investment

Connection Type	Appliances Supported	Qty	Monthly Charge
Basic	2W LED	2	
	Cell Phone Charging 5W	1	
			200
Normal	2W LED	2	
	Cell Phone Charging 5W	1	
	Fan 10W	1	
			350
Super	2W LED	1	
	Cell Phone Charging 5W	1	
	Fan 10W	1	
	Cooler 20W	1	
			500

Scenario 1

Connection Type	Qty	Collections
Basic	5	1000
Normal	3	1050
Super	2	1000
	Total	3050

Scenario 2

Connection Type	Qty	Collections
Basic	10	2000
Normal	0	0
Super	0	0
	Total	2000

Scenario 3

Connection Type	Qty	Collections
Basic	0	0
Normal	0	0
Super	10	5000
	Total	5000

Breakeven Period: 3 to 4.5 years

Lessons learnt

- Logistics planning is key to success
- Local expertise is a must [therefore partnerships or local employees]
- Convincing the people to adopt new services
- Collection mechanism has to be robust otherwise theft and fraud starts happening
- Village level inventory to provide incessant service
- Standardization of process is a key to expansion
- Social engineering

Thank you

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