PACKAGE ON AFFORDABLE ELECTRICITY FOR HOUSEHOLDS

Development Alternatives

TARA

Affordable Electricity for Households

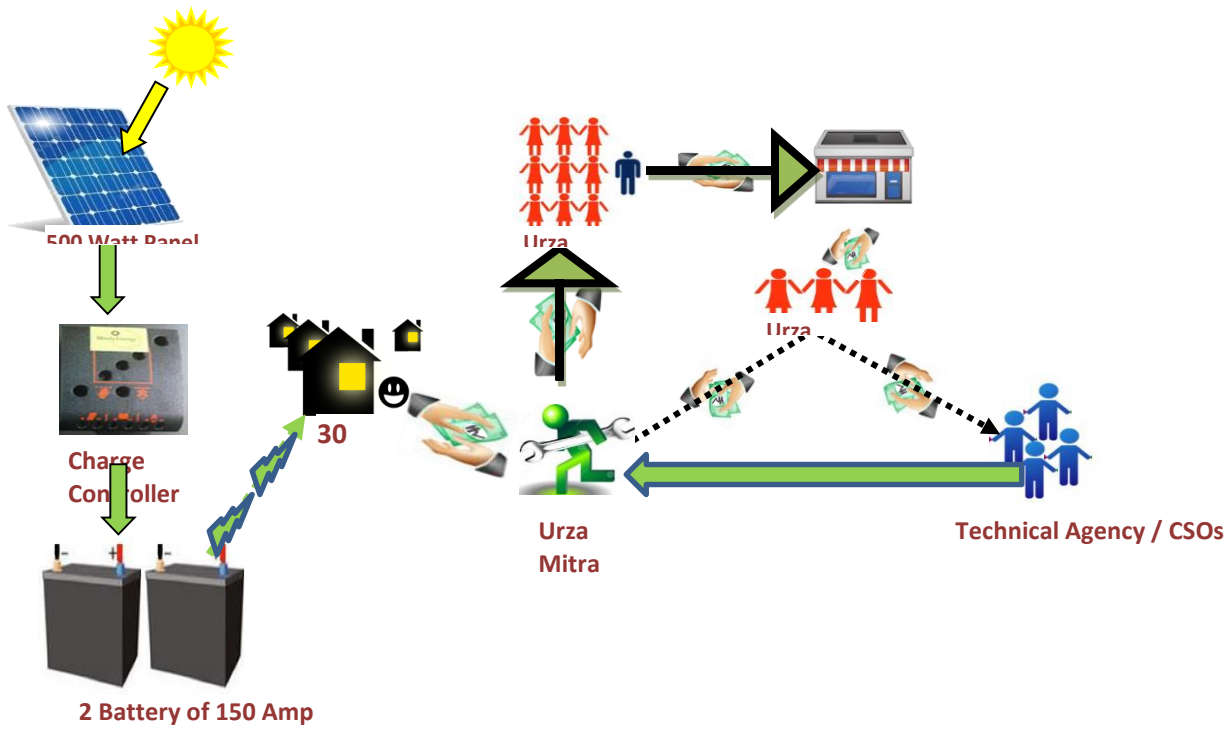
Community Owned & Operated Model

A. Introduction

Lack of Access to reliable electricity supply hampers the overall socio economic development of a geographic region. Lot of initiatives on Institutional and policy have been taken by the state and central government to address the issue but due to lack of political will, poor planning and electricity theft are major causes which have left many villages in India without electricity. The structure targets the use of natural resources such as sun's rays to address the basic needs like electricity, currently state as well as central government focused on solar based rural electrification for reliable electricity.

B. About Model

The lightning model is innovative because of its minimal infrastructure setup, low maintenance cost, & have easy installation with simple technological intervention uniqueness of this model is it doesn't require single piece of land this can be easily mountable on the roof top of a HH. The best feature of this model is at a same time 30 HHs can be connected to the same network for accessing 6-7 hrs reliable electricity. Model is easily adopted by the community because they are involved in the process from planning to implementation & monitoring processes. This is a very useful /effective for the semi-arid regions like Bundelkhand where sunny days are around 300 days



Rural Electrification Model

C. Major steps for Starting Intervention

	Steps	Indicator
Assessment	Selection of village	Off Grid Areas / Small Hamlets
	Close Proximity of Houses	Cluster of Houses should be < 20 feet in series to reduce power drop
	Grid Mapping Exercise	Layout of Household
	Site identification for establishing panels	✓ Roof top check with no hindrance for blocking sunlight ex Trees ,Buildings) ✓ Panels should be positioning towards sun and should be installed in a 15-45 degree inclined angle for absorbing sunlight
	Community engagement in Operation & Maintenance	Identification of potential community member preferably youth having knowledge on electrical works
	Steps	**Indicator**
Awareness Generation	Creating awareness and ensuring community participation	Meeting with Stakeholders and existing community institutions for getting NOC & WCC
	Revenue Model	Need Assessment

	Steps	Indicator
Community Action	Formation and strengthening of strong community institutions	Representative from village-level should be formed in comprising of 10 women and 1 member from CSOs, the members of which to be chosen based on the community's consensus. *(Urja Samiti)*
	Installation of solar Pico-grids	Identification of roof for installation with proper agreement with HHs for installing panels on particulars roof top
	Lay out of wires	Series layout in all 30 HHs
	Training to *Urja Mitra* on technical issues	Giving knowledge on all parts of Pico-grids (Charge controller, battery indicator, distribution box installation, on/off system.
	Leveraging of resource (asset, cash and kind)	To be passed during community meeting in which all HHs agree to provide some resources during installation of wires during connection.

D. Design of the model and corresponding benefits to Community or Beneficiary

	Design	Benefits
Technical Design	Installation of Double Solar Photo-Voltaic Panel (SPV Unit) with DC Transmission system provides electricity for lighting 2 LED (3W x2) and 1 charging point, for a minimum of 6-7 hours a day for 30 households in a village which are in close proximity as a cluster.	Supply of Reliable electricity with Led bulbs for 6-7 hrs during evening hours. For easy communication a mobile charging point is placed in the distribution box for charging of mobile phones for all 30 HHs. 30 HHs residing in a cluster or small hamlets, villages can be easily connected to the system at the same time The use of renewable energy allows the system to function with a minimal carbon emission.
Process Design	A series of meeting with community should be held the village community & Panchyat representative is held to explain about technical and social aspects of model Identification of sites for installation of technology. Discussion on the implementation mechanism. Formation of community base institutions like *Urja Samiti* for collection of monthly fees and discuss bottlenecks.	The meeting makes all technical (Feasibility Study, Resistivity test, Site finalization) and financial (Project Cost, Community Contributions, Breakeven, NOC & WCC) information relating to the project transparent. The community will be taking care of maintenance, repair and replacement expenses independently through its accumulated fund, rendering the model sustainable over time.
Institutional Design	A village-level committee, *Urja Samiti*, should formed in the village comprising of 10 women and 1 member from CSOs, the members of which are chosen based on the community's consensus. The *Samiti* undertakes collection of the monthly charge, ongoing maintenance and repairs. The technical agency/CSOs should selects a *Urja Mitra* from the village who have some basic knowledge on electricity repair & Maintenance.	The *Samiti* will be empowered to make decisions because of its representative nature as well as the funds it accumulates. This represents an excellent example of community governance of an important resource. Youth will be engaged into green jobs.

E. Innovation in Model

Technology Innovation- **System providing electricity for lighting 2 LED (3W x2) and 1 charging point, for a minimum of 6-7 hours a day for 30 households in a village which should be in close proximity as a cluster.**

Social Innovation- **A decentralized village based approach should be identified for producing and supplying solar electricity in the villages for Households which will be managed by local community institutions , *Urja Samiti* & *Urja Mitra*.**

Economic Innovation-Every household would be charged a monthly tariff for electricity consumption.

Environmental- **The model is environmentally friendly,since the energy needs would be met through renewable source of energy (Solar Energy), the idea leverages itself against the reduction use of diesel & Kerosene for HH Electrification. *(Co2 emission will reduce approx 4000 kg per year after opting this technology***

F. Sustainability Approach

Sustainability Approach- For long term sustainability community involvement in implementation & monitoring of system through community based organization will lead to sustain technical, social, Economic & Environmental components of the model.

G. Role of Stakeholders in Management Process of HHs Lightning

Stakeholder	Roles
Urja Samiti **(10 Women + 1 member of DA)**	▪ Grid Mapping Exercise ▪ Monthly revenue Collection and documentation ▪ Money transfer to Technical Agency/CSOs ▪ Operation of Bank account ▪ Monthly disbursement to *Urja Mitra*
Urja Mitra **(Youth Engagement)**	▪ Planning of Grid Implementation ▪ Monthly revenue Collection and deposit in bank account ▪ Ensure smooth operation and maintenance of pico grids

Technical Agency/CSOs	▪ Technology Provision ▪ Equipment's Provision ▪ Maintenance ▪ Training of *Urja Mitra* in operation and maintenance ▪ Open Bank Account and jointly look after its operation with *Urja Samiti* ▪ Selection of *Urja Mitra*

H. Economics of 1 Pico-grids Unit connecting 30 HH

CAPITAL INVESTMENT			
Particulars	**Quantity**	**Unit**	**Amount**
Solar panels 250 Watt	2	unit	83000
Battery 150 Amp/12 V	2	unit	30000
Wires 2.5 & 4 MM wires	1220	metre	48800
Miscellaneous	30700		30700
Total			**192500**

Note: The cost mentioned in operational expenses will be beared by *Urja Samiti*

OPERATING EXPENDITURE			
Particulars	**Quantity**	**Unit**	**Amount**
Salary for operator. Operates at part-time dedication	1	operator	10,800
Bulbs	20	Led Bulbs	1,000
Distribution box	20	units	1,800
Total operating expenditure			**13,600**

RATE STRUCTURE | FIX PRICE					
Particulars	**Quantity**	**Unit**	**Monthly charge**	**Revenue/unit/year**	**Total revenue**
Monthly payments	30	household	150	1,800	54,000
Total revenue					**54,000**
Current number of households					30
Operational cost per HH					453
Total number of households needed for operational break even					**8**
Profits per year					40,400
Number of years needed to recover capital expenditure					**5**

I. Abbreviations

NOC	**-**	**No Objection Certificate**
WCC	**-**	**Work Completion Certificate**
SPV	**-**	**Solar Photovoltaic**
HH	**-**	**House Holds**
LED	**-**	**Light Emitting Diode**
CSOs	**-**	**Civil Society Organizations**
MM	**-**	**Millimetre**
DC	**-**	**Direct Current**