

Rural Electrification Best Practices

GENI White Paper

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Photo courtesy: www.easyenergy.com

Introduction:

It is now an established fact that energy poverty has a debilitating impact on human development, particularly in the rural regions of the developing countries. As it has been estimated, over 1.3 billion people globally are without access to electricity. A large portion of this population consists of women and children who spend considerable amount of time every week gathering biomass and drinking water instead of their own socio-economic development. Energy poverty not only limits access to energy but also has several detrimental impacts on the lives of the people. More than one billion people in developing countries lack access to proper healthcare due to lack of electricity. Similarly education, and livelihood generation activities are equally impacted by energy poverty, thus creating a vicious circle of poverty.

Although, energy poverty is a chronic problem, it is not without hope. The rise and growing popularity of renewable sources of energy holds great promise for the rural populace who are currently deprived of energy. In fact, looking around we find a host of rural electrification projects based on renewable sources of energy that has successfully electrified some rural

communities in developing countries. However, while some villages have benefited from these rural electrification projects, millions still wait for that glimmer of light.

In this paper, we take a look at some of the best practices/some do's and don'ts that hold the key to most of the successful rural electrification projects that will facilitate other similar communities in charting their paths to rural electrification and energy poverty alleviation.

Some Dos:

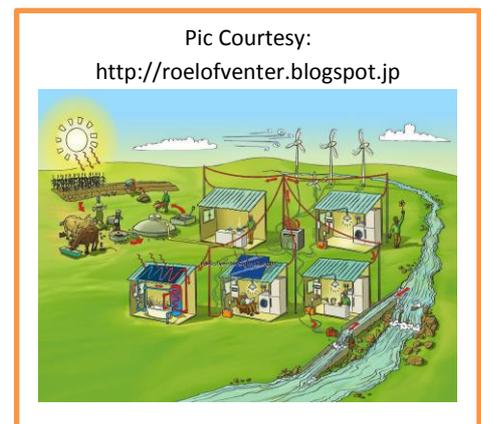
1/ **Harness locally available resources:** For building rural or semi-urban electricity projects emphasis should be put on harnessing locally available renewable energy (RE) or combination of renewable energies as well as other necessary resources, like readily available manpower skills, local connections to government bodies, national (and international) funding organizations, etc.

E.g. - ["Hybrid" buildings harness resources](#)



How Biomass Energy Works

2/**Prioritize socio-economic development of local community:** From early stages these projects should work in the direction of bringing about progressive socio-economic development of the local community, i.e. generate jobs, facilitate informal income generation avenues, social protection etc., wherever they are installed. Moreover, these projects need to prioritize protection and sustainability of the local environment.



E.g. - [How a small Spanish island became a renewable energy pioneer](#)

3/ **Capacity-building of all stakeholders:** These projects should focus on capacity development of all stake-holding actors on a regular and continuous basis, like project developers, governmental officials, regulators, local distribution utilities, financing service providers, and the community. This ensures continuous upgrading of skills and knowledge of the participating actors in tune with environmental changes in time and necessity.



E.g. - [Sub-Strategy 3: Capacity Building \(Australia National Community Energy Strategy\)](#)

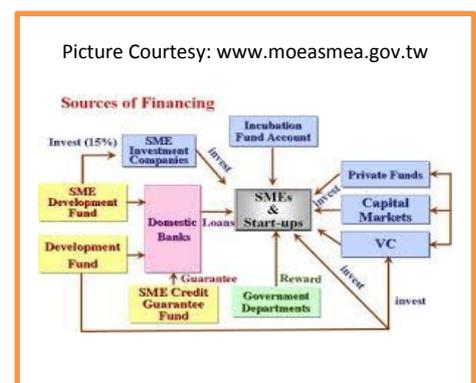
4/Establish optimal grid-connectivity in holistic manner:

For supply of electricity to any rural or semi-urban locality, whether scattered or concentrated, emphasis should be put on building connectivity using off-the-grid projects (like stand-alone power system or mini-grids) or grid-connected projects (like 'under-grids'- households and business that are near but not directly connected to a main grid) depending on technical feasibility and cost-efficiency. Also, an integrated planning approach, involving social, economic, environmental and geographic, should be applied while building (intra or inter) grid connectivity.



E.g. - [A Community Based Approach for Sustainable Off-Grid PV Systems in Developing Countries](#)

5/ **Synergise purpose and allocation of funds:** Subsidies of various forms for such projects (like start-up loans, grants, loan guarantees, technical assistance etc.) being offered by various institutions/ sources, like government schemes, international development organization programs, private donations, etc., should be complementary in nature. This means funding and supporting bodies should work to establish strategic interaction among themselves and synergize their work plans, goals and standards concerning equipment, carbon emission, etc.

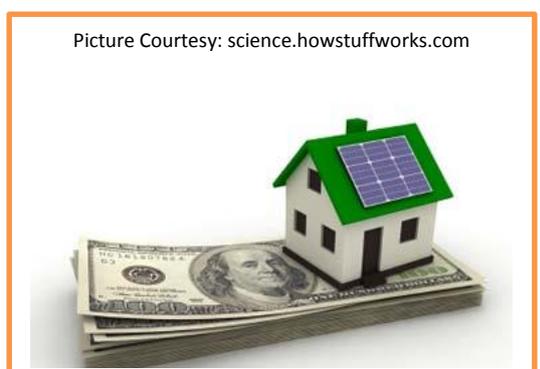


E.g.- [Public intermediaries and use of dedicated green funds](#)

6/ **Ensure flexibility and systemization of funds:** Subsidies and grants for initiation, operation and sustenance of such projects should be allocated in a phase-wise manner and also take into account overall technical and economic performance of different plants on a case-by-case basis. Although, there should be certain pre-defined standards for assessment of performance measure of these projects, however, marked emphasis on achieving or surpassing that standard should not be the guiding principle for their functioning.

E.g. - [Investigating more flexible charges for local renewables](#)

7/ **Support adequately:** The subsidies for these projects should be adequate in quantitative and qualitative terms, be disbursed in a timely manner and have minimal bureaucratic



hurdles from the perspective of project developers and financiers. Inappropriately designed regulations and inefficient subsidy disbursement mechanisms usually jeopardize the financial viability of private developers and drive them out of the market.

E.g. - [Renewable Energy Programmes Gets A New Impetus; Focus on Development of Energy Infrastructure](#)

8/ **Regulate customer tariff:** The customer tariff for renewable energy based electricity should be regulated under defined government policies/ directives and monitoring mechanisms. This is in order to avoid putting any excessive economic burden on the customers while ensuring accessibility and security to electricity supply.

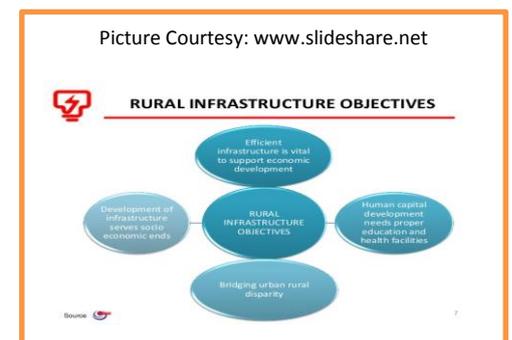
E.g. - [Light and Hope: Rural Electrification in Peru](#)

9/ **Put-up Monitoring and evaluation mechanisms:** There should be an established monitoring and verification mechanism at the local level- comprising of members belonging to all stake-holding parties to such projects and independent expert monitors- in order to access the development of such projects as well as overall electrification scenario in any country.

E.g.- [Monitoring the energy efficiency service market in Germany](#)

10/ **Build Inter-project harmony:** The development and operation of such projects should be on a harmonious note. This essentially means the projects apart from having considerable high degree of technical compatibility, which leaves scope of integration in future, should also bring about socio-economic development of communities on a mutually complimentary basis.

E.g. - [The Nordic Electricity Exchange and The Nordic Model for a Liberalized Electricity Market](#)



Some Don'ts

1/**Avoid fixation with renewable energy based projects:** Renewable Energy Electrification projects should not be considered as most productive projects among all available options without prior assessment. Such projects are definitely not the ends in themselves, and are

rather one of the mediums for attaining desired ends- i.e. common welfare of the societies. Similarly, fossil fuel based energy systems should be outrightly considered as defected for sustainable development.

E.g. – [Renewable Energy Myths 1: Inevitability, Or Bad Timing: A Renewable Obsession](#)

2/Avoid under-emphasizing local communities/ institutions: Stakeholder participation of local rural/ semi-urban communities in electrification projects should not be underemphasized. Effective collaboration between the stakeholders hold the key to the successful execution of the project. The primary stakeholders are the rural community, the local self-government, the microfinance agencies, the implementing NGO(s), the renewable energy equipment suppliers and the small-scale energy producers

E.g. [Why the US has not made more progress in moving to a renewable energy future – a personal view \(Allan Hoffman\)](#)

3/ Avoid unconditional replication of successful models: Attempts should not be made to wholly replicate successful renewable based electrification systems- which exist in a particular region- across wide territories. This is for the fact a successful model in a particular locality/ region may not be equally successful in other places due an array of reasons, like geographical and environmental differences, disparities in economic capabilities among people, variances in locally available renewables.

E.g. - [14MW power only after billions spending \(Pakistan\)](#)

4/ Exclude unclear supporting components: Subsidies and grants should not be implicit, as they often tend to be. E.g. waiving of defaults or non-payment of electricity bill, untargeted subsidies (like subsidized energy used by all), in-discriminatory subsidies (like subsidy for a quantity that is well above what is needed by a rural or poor populations), complex formulas for determining subsidies (like theoretical calculations for subsidizing targeted groups) and overly restrictive with respect to end use or technology (like hesitance on part of government bodies to enable local communities take ownership of electricity projects).

E.g- [EU law unclear on integrating renewable power: Wynn](#)

5/ Avoid 'top-down approach': Project developers, operators and other involved stakeholders should avoid pursuing the common 'top-down approach'. This approach instils hierarchy of positions and rigidity of working patterns, which deprives local communities from getting equally empowered and involved in electrification projects as their counterparts- i.e. the policy makers and private investors/ entrepreneurs. Hence, the 'bottom-up approach' to electrification projects is a relatively better alternative.

E.g.- [Grounding Green Power: Bottom-Up Perspectives on Smart Renewable Energy Policy in Developing Countries](#)

[From the Bottom Up : How Small Power Producers and Mini-Grids Can Deliver Electrification and Renewable Energy in Africa](#)

6/ Avoid total reliance on government funds: For actualization and efficient functioning of rural/ semi-urban electrification projects, subsidies and government funds should not be relied upon solely. Private sector investments and micro-funding by community members, under a milieu of pre-defined laws and regulations, is extremely important to scale up such projects in a sustainable manner. Ideally, public-private partnerships should be developed for such projects on transparent and accountable terms.

E.g.- [Government Subsidies: Silent Killer Of Renewable Energy](#)

7/ Avoid taking a narrow look at problems-in-hand. Any problem that arises in course of project development and operation should not be tackled in a way that the problem gets addressed temporarily. It is important to develop holistic socio-technical redressal mechanisms for dealing with electrification problems, and thereby involve all stakeholding parties.

E.g.- [Barriers to Renewable Energy Technologies](#)

8/ Avoid concentration of decision-making powers: Disproportionate concentration of powers and authority in the hands of few for rural/ semi-urban electrification projects defeat the direct purposes and larger objectives associated with these projects. Communities along with the policy makers and private investors should be equally empowered to make decisions relating to different dimensions of electrification projects at their respective levels.

E.g.- [Renewables Not Enough: World Needs Democratic, Decentralized Energy, says \(Worldwatch Institute\) Report](#)

9/ Avoid attempts to translate theoretical concepts into practice: Problematizing and attempting to answer research questions, even those happening on-the ground, is good. However excessive attempts should not be made to emulate research findings in practice for reality greatly varies from abstract theory.

E.g.- [Energy Modeling Isn't Very Accurate](#)

10/ Avoid over-exploitation and under-exploitation of renewable resources: Locally available renewable resources should not be exploited in a way that puts undue pressure in sustaining its availability or has detrimental effects on the local environment. Renewable resources as the name suggest or commonly assumed in not absolutely unlimited in any given territory, and has its own constrains for sustainable development. On a similar note, under-

exploitation of renewable resources at any local level will not deliver optimal energy output that will not bring about sustainable development.

E.g.- [Exploitation of Natural Resources](#)