

Workshop on Grid-tied Mini Grids: Last Mile Energy Access

Date: October 25, 2017

Venue: Vivanta by Taj Ambassador, New Delhi

The Center for Study of Science, Technology and Policy (CSTEP), in association with the Good Energies Foundation and Wipro Limited, organised a workshop on grid-tied mini grids. The objective of the workshop was to discuss the role of mini-grids in the quest to increase rural energy access, considering grid expansion (Saubhagya Yojana).

Dr. Anshu Bharadwaj, Executive Director, CSTEP, in his welcome note, urged the audience to think of pragmatic solutions to ensure 'electrification for all'. Shri P.K. Pujari, Ex. Secretary, Ministry of Power (MoP) and current advisor to the International Solar Alliance (ISA), in his inaugural address highlighted the larger issues of quality and availability of power and stressed on the role of mini grids, especially in difficult terrain.

The CSTEP presentation made by Ms. Vaishalee Dash, Senior Research Engineer, titled 'Techno-Economic Analyses for Mini-grids in India', described off-grid scenarios and plausible models for grid-tied mini grids.

The panel discussion on 'Grid-tied Mini-grids: Last Mile Energy Access' was moderated by Mr. Deepak Gupta (Senior Programme Manager, Power, Shakti Sustainable Energy Foundation). The panel included Shri Deepak Gupta (IAS and former Secretary, MNRE, Hon. Director General, NSEFI), Dr. O.S. Sastry (Sr. Consultant, ISA), Shri Gopal Saxena (Director, BSES Rajdhani & Yamuna Power limited), Col. Vijay Bhaskar (Managing Director, MLINDA) and Dr. Disha Banerjee (Director, Policy and Communications, Smart Power India).

Important points that emerged from the discussion are as below:

- Household level electrification is still a major challenge. However, it is important to avoid duplication of infrastructure for power supply in order to prevent wastage of resources.
- Synergising the scope of operation for grid and off-grid systems is feasible; grid-tied mini grids appear to be a good solution in this respect.
- Mini grids make a viable option for un-electrified villages in difficult terrain or insurgency affected areas.
- There is a need for detailed understanding of consumer demand (real time) in rural areas.
- Local entrepreneurs can help in aggregating demand and creating employment.
- Though the cost of monitoring and control is a significant component of the capital expenditure for mini grids, many developers feel it is necessary for efficient operation of the plant
- For grid-tied mini grids, the distribution network could be a DISCOM's responsibility and scope of developer could be limited to generation, O&M and overall management of plant.
- Mini grids should be sized with a provision to scale up, if needed.

- There is a clear need to orient demand side load management by integrating energy efficient devices, mini cold storages and drinking water facilities.
- Carefully monitoring the quality of inverters is important as they play a key role in power factor management in mini grids.
- It was emphasised that the availability of grid is critical for import or export of power.
- Consumer affordability of power from mini grids is an issue and typically varies from one region to another.
- Mini grid business models are mostly built on scarcity scenarios. However, to scale up such mini grids, a business model based on surplus scenario is needed.
- Solar PV makes more sense at decentralised levels, i.e. producing and consuming locally. Hence, policy should be oriented and pushed towards decentralised solar plants.

Shri P.S Narayan, (V.P & Head of Sustainability & Social Initiatives, Wipro Limited), in his closing remarks, emphasised the role of energy in inclusive growth of the underprivileged. He acknowledged the work by many urban centric organisations and governments in energy efficiency and enhancement of renewable energy footprint.

Concluding Remarks:

Mini grids improve the availability and reliability of power for rural communities. They also provide opportunities for integrated village development. Although the Electricity Supply Companies (ESCOs) provide subsidised electricity as per the government's intent, there are still several areas where low electricity access is a concern. Therefore, the strengths and shortcomings of both entities can be merged through an overarching policy to find viable solutions.

List of Attendees for the Event

Inaugural Address: Shri P.K. Pujari, Ex. Secretary, Ministry of Power (MoP)

Panellists:

Moderator: Mr. Deepak Gupta (Senior Programme Manager, Power, Shakti Sustainable Energy Foundation)

- Shri Deepak Gupta (Ex-Secretary, MNRE)
- Dr. O.S. Sastry (Sr. Consultant, ISA and Ex-DG, NISE)
- Shri Gopal Saxena (Director, BSES Rajdhani & Yamuna Power Limited)
- Col. Vijay Bhaskar (Managing Director, MLINDA)
- Dr. Disha Banerjee (Director, Policy and Communications, Smart Power India)

Closing Remarks: Shri P.S. Narayan, V.P & Head of Sustainability & Social Initiatives, Wipro Limited

List of attendees:

- Dr. P.C. Maithani, Advisor – MNRE
- Dr. Sanjay Bajpai, Scientist ‘G’ – Head, Technology Mission Division (DST)
- Shri Lourembam Manglem Singh, Director – Government of Manipur
- Shri Srikant Sharma, Consultant – MNRE
- Shri Rakesh Kumar, Programme Director – ISA
- Shri P.C. Sharma, Consultant (RE) – ISA
- Shri Sanjay Khazanchi, Transformative technologies- CEO-INDIA, Rural Electrification
- Shri Debajit Palit, Associate Director –TERI
- Shri Imad Siddiqui, Director – Schneider
- Shri Sandip Sinha, Vice President- Micro-Grid Programme – ABB
- Col. Baljit Singh , Country Director & COO – HUSK POWER
- Shri Amit Kumar, Associate General Manager – Schneider Electric
- Shri Anshuman Lath, Director – Gram Oorja
- Shri Varun Kumar Singh , Sr. Manager –SUN Group
- Shri Srinath Himanshu , Manager, Business development – SUN group
- Shri Bhaskar Deol, CEO – Mynergy
- Shri Simran Gover, BASK Research Foundation
- Shri Abhishek Jain, Senior Programme Lead – CEEW
- Ms. Sharbanee Bhattacharyya, Manager- CSR – BOOND
- Shri Chandan Singh Bhagour, Sr. Engineer – ESS-BHEL
- Shri Kaushal Kumar, Engineer – BHEL
- Ms. Radhika Sharma, SSEF – Programme Associate
- Ms. Saloni Sachdeva, SSEF
- Ms. Ashwini Mudgal, Associate Fellow – TERI
- Shri Kapil M, RA – TERI

Annexure – I

Agenda and Concept Note

Agenda: Round Table Discussion Grid-tied Mini Grids: Last Mile Energy Access

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9:30 – 10:00	Registration & Coffee/Tea
10:00 – 10:10	Welcome note by Dr. Anshu Bharadwaj, Executive Director, CSTEP
10:10 – 10:25	Inaugural Address by Shri P.K. Pujari, Ex-Secretary. Ministry of Power
10:25 – 10:40	Presentation by CSTEP on <i>Techno-economic Analyses of Mini Grids in India</i>
10:40 – 11:40	<p>Panel Discussion Moderator: Shri Deepak Gupta (Senior Programme Manager, Power- Shakti Sustainable Energy Foundation)</p> <ul style="list-style-type: none"> • Shri Deepak Gupta (Ex-Secretary, MNRE) • Dr. O.S. Sastry (Sr. Consultant, ISA and Ex-DG, NISE) • Shri Gopal Saxena (Director, BSES Rajdhani & Yamuna Power Limited) • Col. Vijay Bhaskar (Managing Director, MLINDA) • Dr. Disha Banerjee (Director, Policy and Communications, Smart Power India)
11:40 – 12:40	Interactive session
12:40 – 12:50	Closing Remarks by Shri P. S. Narayan, V.P & Head of Sustainability & Social Initiatives, Wipro Limited.
12:50 – 12:55	Vote of Thanks, CSTEP
13:00 – 14:00	Lunch

Concept Note

Grid-tied Mini Grids: Last Mile Energy Access

The [Grameen Vidyutikaran](#) (GARV) dashboard indicates that about 2900 villages in India (16% of the target 18,452 villages identified by Ministry of Power) are yet to be electrified as on September 25, 2017. The cumulative number of households waiting for power supply is close to 4 crore. Moreover, majority of the ‘officially’ electrified villages face a huge demand-supply gap, and access to power is unreliable or of low quality. In many rural areas, electricity is barely available for meeting basic load demand and is insufficient for economic use and development.

Solar photovoltaic (PV) prices have decreased drastically in the recent past. This presents an opportunity for PV-based mini grids to help improve energy access in remote locations where solar insolation is good. Currently, mini grids in India exist as off-grid systems or in-parallel with the central grid. Most of them use renewable energy (RE) such as solar PV or biomass, and are supported by battery storage which is expensive. Grid interconnection of mini grids gives an advantage of operating it without a large storage system, since the grid is available as “top-up support”. Grid-tied mini grids help support heavier loads such as irrigation pumps and micro-enterprises. These also help in minimising distribution losses for Distribution Companies (DISCOMs) by enabling localised generation and consumption of power. Hence, grid-tied mini grids appear to be a promising solution for India’s electrification challenges, going forward.

Currently, there is no national policy to promote mini grids, but a draft policy by MNRE is in existence. Uttar Pradesh is the only state to have released a mini grid policy. However, the existing guidelines have not delved much into grid interconnectivity aspects and service models required for enabling grid-tied mini grids. The mechanism of engagement between Rural Energy Supply Providers (RESPs), State Electricity Regulatory Commissions (SERCs) and DISCOMs is unclear. In addition, grid interconnection currently involves multiple stages of approval. Compared to the highly subsidised power available in rural areas, the cost of reliable power from mini grids is expensive. This increases the investment risk for RESPs and fails to attract the private sector.

CSTEP has conducted a preliminary analysis on grid-tied mini grids and we are organising a Round Table to brainstorm with policy makers, mini grid developers, utilities and think tanks to evolve a road map for future deployment of mini grids in India. Based on the outcome of the discussions, a detailed study could be jointly conducted to arrive at viable business models for the sector. This will also involve coordination with regulators and government departments such as DISCOMs, SERCs, MoP, MNRE, REC, etc.
