National Policy for Renewable Energy based Micro and Mini Grids

The objective of the policy is to promote the deployment of micro and mini grids powered by RE sources such as solar, biomass, pico hydro, wind etc. in un-served and underserved parts of the country by encouraging the development of State-level policies and regulations, that enable participation of ESCOs.

Renewable Energy based micro and mini grids with its enormous potential are a promising solution to the access to energy challenge in the country. They offer the benefits of boosting local economy by meeting energy needs of residential and commercial activities thereby supporting enterprise development, generating employment opportunities, raising individual/ household incomes etc. The Ministry therefore plans to support its expansion on a large scale through its various on-going programmes. In this regard, the Ministry is issuing a policy offering likely implementation solutions and approaches for overcoming common issues and challenges that hamper the growth of mini grid sector. The States are encouraged to refer to this policy for developing their respective programmes, policies and regulations. The underlying principles of the policy are:

- Mainstream RE mini grids for enhancing access to affordable energy services, and improving local economy
- Streamline project development procedures for ESCOs
- Provide operational frameworks to operate along with the Distribution Company (DISCOM) grid
- Optimize access to central financial assistance and other incentives
- Foster innovation in mini grid models to cater to rural needs

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Scope of Policy

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The Ministry targets to achieve deployment of at least 10,000 RE based micro and mini grid projects across the country with a minimum installed RE capacity of 500 MW in next 5 years (taking average size as 50 kW). Each micro and mini grid project should be able to meet the basic needs of every household in vicinity, and also aspire to provide energy for services beyond lighting such as fan, mobile charging; productive and commercial requirement.

The principal elements of the policy are applicable to all States in the country. The recommendations of the policy are exclusively for RE micro and mini grids and intended to support the development of the sector.

Micro and Mini Grids

A 'Mini Grid' is defined as a system having a RE based electricity generator (with capacity of 10KW and above), and supplying electricity to a target set of consumers (residents for household usage, commercial, productive, industrial and institutional setups etc.) through a Public Distribution Network (PDN). A 'Micro Grid' system is similar to a mini grid but having a RE based generation capacity of below 10KW. Micro and mini grids2 generally operate in isolation to the electricity networks of the DISCOM grid (standalone), but can also interconnect with the grid to exchange power. If connected to grid they are termed as grid connected mini/ micro grid.

Type of System Configurations

The generator of a mini grid can be powered by RE sources such as solar, biomass, wind, small hydro or other notified sources and can have diesel-based generator as a backup. Hybrid systems using a combination of resources like those that of solar-wind, solar-biomass, solar-hydro etc. can also be deployed. The Public Distribution Network of a mini grid can be designed to carry either Alternating Current or Direct Current (AC or DC).

Types of Tariff and Revenues

Existing Policy and Regulatory Provisions:

The Electricity Act, 2003 (Eighth provision of Section 14) exempts ESCOs from the mandatory licensing requirement for distribution of electricity in notified rural

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areas and eligible areas as may be defined under the relevant policy of the State. Because of the absence of license, State Electricity Regulatory Commission (SERC) do not have mandate to govern the tariff, and so private ESCOs can charge the consumers on a mutually-agreed term. Consumers have the default choice of not availing their service if found unacceptable for economic or any other reasons, and choose any alternative offering instead. It is expected that the competition will play a significant role in ensuring electricity access to all.

The existing policy and legislative framework (Section 8.6 of Rural Electrification Policy, 2006) also stipulates that if Central and or State Financial Assistance (subsidies, incentives etc.) are availed, the benefits need to be passed to the consumers. In instances, where mini grids connect to the DISCOM grid and sell excess power, the SERC will need to approve a tariff basing on rules under law that stipulate cost-reflective structures. Some government schemes where subsidy is provided may specify tariff to be charged or may require approval of tariff by a government authority or agency. Therefore tariff may be set as follows:

1. Where no subsidy or grid connectivity is provided- As per market
2. Where subsidy is provided – With concurrence of defined State government authority
3. Where grid is connected–SERC

Costs, Revenues and Pricing Mechanisms:

The cost structure of a mini grid project will have the following elements as in any other business – Fixed

Costs and Variable Costs.

- Fixed costs: include cost of project development, generation plant, storage systems (batteries), inverters, distribution network, cost of availing debt including interest charges, fixed taxes and fees (ex: on infrastructure, land etc.).
- Variable costs: which is the running charge for operation, maintenance and management depends on the demand and includes costs of fuel, oil, maintenance costs that depend on plant runtime/ output, load-dependent technical (conversion) losses in inverters, copper losses of transformers, in storage devices, energy-related taxes and fees etc.
- Revenue Sources: Long-term sustainable operations will require that projects recover fixed and variable costs and the ESCOs are able to be earn a reasonable return. The possible revenue sources for mini grids are fee for connections, sale of electricity, and through grants/ subsidies, if available.

As most communities in rural areas are very sensitive to price, project designs need to be extremely thoughtful ensuring affordability of the service.

Policy, Regulatory and Implementation level Interventions

Solutions for specific implementation-related and technical challenges impeding the growth of the micro and mini grid sector have been discussed in the succeeding sections of the policy. Based on these recommendations, States may develop policies, implementation frameworks and supporting regulations as required.

Implementing Partner

The Ministry will implement the mini grid programme through multiple partners:

- State Nodal (Renewable Energy Developmental) Agencies (SNA)
- Public Sector Organizations (Ex: SECI)
- Rural Energy Service Providers (RESPs),
- Financial Institutions (NABARD/IREDA/ RRB/Commercial banks)
- Panchayats

Project Site Identification and Development

The involvement of the State Government and/ or DISCOMs in the SNA route for implementation makes the process straightforward hence making project identification more certain, and the development and execution easier. While on the other hand for private implementing agencies, specific interventions in policy and/ or programme design will be needed in order to streamline the project development processes. Following measures should be considered for easing project development activities, and should ideally be applied simultaneously for effectiveness.

1. Single Window Support Channel
2. roject Information System

Planning and Development

The State government/ SNA is expected to consider defining a decisive plan or an approach for mini grids in the State. It will build the necessary confidence amongst ESCOs and investors interested in this

space. States may consider classifying regions/ areas based on their priority for electrification; means (grid, off-grid or both); and or based on the type of government programme. For example, States may consider adopting the following approaches:

- Unlimited (Open Market) Approach: Private ESCOs are allowed to operate in any DISCOM grid connected or off-grid areas, and multiple ESCOs are allowed to operate in any area.
- State plus Open Market (Mixed) Approach: State (or SNA) notifies priority (programme) areas, which are to be taken up through state-governed approach. Private ESCOs are allowed to operate in non-programme as well as programmes areas, and multiple ESCOs are allowed to operate in any area. Under this situation, private sector investors will have visibility to undertake investment decisions.

Clustering and Size of Projects

The Ministry is in favor of deploying large-sized mini grid projects, and recommends ESCOs to deploy projects with capacities above 10KW. ESCOs interested to deploy micro grids (less than 10kW) are recommended that they install projects in a cluster format–in contiguous areas – to improve operational and cost efficiency. The cluster format offers the possibility of interconnecting projects in the future. The same principle may be applied to mini grids (> 10kW), wherever feasible.

For tracking mini grids development in the country, the projects will be categorized based on installed capacity, and will be identified as under:

- Less than 10kW – Category A
- From 10 KW to 100 KW–Category B
- From 100 KW to 250 KW–Category C
- From 250 KW and above–Category D

Role of State Nodal Agency

SNA will keep line record of all the Mini and micro grids in the state. SNA will be the superviser organisation for all mini and micro grids. It will provide guidance and help whenever required. SNA will step in if any micro grid is abandoned and revive it by getting another organisation to takeover. It may also facilitate injection of funds to revive defunct mini and micro grids.

The Ministry is also exploring mechanisms to boost financial lending for projects. Financing for mini grids through institutions like NABARD/ IREDA is also encouraged

Panchayat and Village Energy Committee

The existing legislative and policy framework makes each level of governance responsible for electrification, including the Central and State Government, District Committees, and Village Panchayats. Panchayati institutions play a crucial role to facilitate electrification in villages, however their role until now has been limited to local approvals, for instance, providing a No Objection Certificate to deploy a project in the village.For the development and upkeep of long-term infrastructure assets like mini grids in villages, Panchayats need to assume a more active role and should involve the community in the process of growth. The Panchayat should constitute a Village Energy Committee (VEC) to ensureparticipation and commitment of the community, from the conception phase of the project itself.

The VEC will work with ESCO to develop and maintain the project. Responsibilities of the VEC can include the following (but not limited to):

- Developing a plan and identifying households interested in getting a connection
- Ensuring connections for households on a priority basis, and quality of power supply
- Facilitating regular payment of tariffs
- Protection of the equipment
- Curbingthe theft of power
- Facilitating resolution of dispute or grievance(s), if any, and others
- Overall Supervision

Financial Assistance and Other Incentives

The Ministry shall continue to provide the upfront capital subsidy it offers for deploying mini grid projects under it various programme. Only approved mini grid RESPs will be eligible for central financial assistance and other privileges.

Central assistance and incentives to RESPs serving a comparatively larger unserved and or under-served population; and RESPs operating in North East (NE) States, Special Category States (Jammu and Kashmir, Himachal Pradesh, Uttarakhand), Andaman and Nicobar, and Lakshadweep Islands shall be accorded priority for allocation. The potential ESCOs from NE and all other Special Category States are particularly encouraged to participate under the programmes.

A State may consider providing additional incentives over and above the existing central financial assistance for projects, under their policy. The incentives (subsidies or grants) can alternatively be structured to support project planning and pre-investment activities (like feasibility and business plans, capacity building efforts and other transaction costs); or in construction phase (for the PDN, meters, connection fees); or for operations (operational subsidy, tariff top ups, cross subsidy). Result/ performance based incentives can be made available to the mini grid operators e.g. on reaching certain milestones.

The Ministry is also exploring mechanisms to boost financial lending for projects. Financing for mini grids through institutions like NABARD/ IREDA is also encouraged. The central subsidy would be channeled from NABARD/ IREDA through to the Regional Rural, Scheduled or Cooperative banks. The RESP mechanism is expected to optimize the project approvals process, and streamline the disbursement and access to programme subsidies. Subsidy will be disbursed to RESPs either directly by the Ministry or through NABARD/IREDA.

Duties such as Value Added Tax, Entry Tax and others have an implication on the cost of service from mini grids. The State governments may consider waiving certain taxes in order to promote the sector. The designated agency for mini grids should make information related to applicable taxes and duties publicly available – this will help ESCOs in making more informed business decisions ◂◂