Government of India
Ministry of New and Renewable Energy

Development of Master Plans for Solar Cities

Instructions/Suggestions for Preparation of Master Plan

1. The Master Plan should be prepared as per details contained in the programme on development of Solar Cities issued vide No. 5/10/2010-11/ST dated 24th January 2011 available on website of the Ministry www.mnre.gov.in. and a separate guidelines for preparation of Master Plans issued by the Ministry (copy enclosed).

2. The Master Plan should broadly contain the following:

[A] Energy base-line for year 2008

- Sector wise data on energy consumption (electricity, petroleum products, coal, biomass, etc) for residential, commercial, institutional, industrial and municipal sectors should be collected.
- The data should be collected through primary sources by interaction/visits with related departments i.e., electricity, transport, agriculture, industry, education, municipal corporations, state nodal agency of renewable energy, tourism etc.
- Suitable formats/questionnaire should be developed and the first hand sufficient data should be collected from concerned sectors through personal surveys for understanding the energy consumption patterns, future demand & efficiency of use etc.
- Energy baseline report should be prepared with reference to the base line year 2008 (31.12.2008) indicating the load profile, peak demand, gap between demand and supply etc.

[B] Demand Forecasting for 2013/2018

- The existing sources i.e., City development plans, JNNURM master plan, Electricity infrastructure/utility plans, Industry and business forecasts by local chambers of commerce and industry, Planning Commission documents, BEEs City Plans, should be exploited to collect the relevant information.
- Based on the past time-series data and information on growth plans, growth rate in energy demand for different sectors can be estimated

[C] Sector wise Strategies

- Carry out techno-economic feasibility of different renewable energy and energy efficiency options for each sector city specific.
- Make a priority list of the options applicable for the sector in the city.

[D] Renewable Energy Options

- RE resources assessment- solar radiation, wind power density and availability, biomass resources and municipal/industrial wastes to identify the potential for the City.
- Listing of potential renewable energy technology options

(a) Solar Energy (Thermal)

Solar water heating systems, Solar cooking at community/commercial places, -Solar steam generating systems, -Solar drying/air heating systems, Solar refrigeration and air conditioning plants, -Solar concentrators for process heat applications etc.

(b) Solar Energy (Photovoltaic)

Solar home lighting systems, Solar generators, Street light solar control systems, Solar advt. hoardings, Solar street light/garden lights, Solar traffic lights, Solar blinkers, Road studs, Solar power packs, Building integrated photovoltaic, Solar power plants for decentralization applications, Solar Roof top plants for replacing DG gensets, Solar charging stations, solar inverters etc.

(**c) Solar passive architecture in buildings/housing complexes**

(d) Waste to Energy Projects based on

Municipal and Urban Waste, Industrial waste, Methane available from STPs, kitchen waste,

(e) Biomass based projects

Biomass gasification,co-generation, combustion, liquefaction, biofuels etc. Biomass gasifier based crematoriums.

(f) Wind Energy

Small aero generators, hybrid systems with spv, biomass, wind pumps etc,

(g) Any other Renewable Energy Systems and devices

[B] Energy Efficiency Measures

3. Priority Areas/Indicative Renewable Energy options for the Master Plan

The sector wise details should be provided in the Master Plan. Few sectors and the commensurate renewable options to be in cluded in the Master Plan are given below.

Sector	**Renewable Energy Options**
Buildings	Rooftop solar power plants, Solar Water Heaters, Energy Efficient Lights, Energy efficient designs, GRIHA Ratings. Solar air conditioning etc.
Shopping Malls	Rooftop Solar Power Plants, Solar Garden lights, Solar Road Studs, Solar Water Heater for Canteens, kitchen waste plants etc.
University/Colleges	Rooftop Solar Power Plants, Solar Garden lights, Solar Road Studs, Solar Water Heater for Canteens and Hostels, Solar Cooking, Solar Lightings, solar street lightings, Kitchen waste plants etc.
Hostels	Solar Water Heaters, Biomass gasifier based cooking, Solar Cooking, Kitchen Waste based plants, Solar Lightings,
Vegetable Markets	Solar Lanterns for Road Shops, Market Waste based Plants, Solar lightings, Solar cold storages etc.
Sewage Treatment Plants	Biogas Generation Plants, Power Generation from Biogas, Biogas Cooking, Solar lightings etc.
Roads	Solar Street Lighting Systems, Road Studs, Solar Traffic Signals, Solar Street Light Controls etc.
Transport	Battery Operated Vehicles, Biodiesel based Buses/ Vehicles etc.
Residential Houses	Solar Water Heaters, Solar Power Generators, Solar Invertors, Solar Home Lighting System etc.
Advt. Hoardings	Solar Hoardings, CFL/LED replacement in hoardings
Markets	Solar Generators, Solar Water Heaters, Solar Power Plants, Solar Lighting Systems, Solar Lantern etc.

Hotels	Solar Water Heaters for water preheating (air-conditioning plant, laundry , kitchen, swimming pool), Waste based Plants, Solar Garden Lights, Solar Road Studs, solar streetlights with automatic control,
Hospitals	Solar Water Heaters (air-conditioning plant, laundry , kitchen, incinerators/autoclaves), Solar Roof Top Power Plants, Solar Lightings, Solar Street Lights, Road Studs
Restaurants	Solar Water Heaters, Solar Lightings, Solar Cooking, Gasifier Based Cooking
Schools	Solar Cooking for Midday Meals, Solar Lightings,
Data Center	Solar lighting , solar air conditioning
MSW Sites	Suitable Technology for MSW Treatment i.e., Inciration, Landfill, Biomethanation, Palletization
Industry	Waste heat recovery, process heat recovery, biogas production for thermal and captive power plant ,biomass gasification, cogeneration , biomass based power plants, SPV power plants inplaceof conventional diesel generation, Solar Water Heaters, solar street lights for industry campus with automatic control, solar drying, Solar air conditioning etc.

4. Master Plans should be commensurate with the implementable proposals on Renewable Energy and Energy Efficiency.

5. It should provide sector wise information on potential for Renewable Energy and Energy Efficiency i.e., schools, industry, hotels, hostels, markets, shopping malls etc.,

6.0 It should provide information on Technology Solutions, RE and EE product information and availability, Financial incentives,

7.0 The estimated cost of the entire package should be provided.

8.0 The Master Plan should provide/suggest amendment in building bye-laws for making use of solar water heaters mandatory in the city, if not done.

9.0 It should also provide Guidelines for implementation by the Municipal corporations and other departments.

10.0 It should contain the detailed inventory of all existing renewable energy projects/systems in the city.

11.0 The details of the renewable energy related policies/incentives existing in the City/State level should be provided.

12. Important: The Master Plan should provide good project reports for the few pilot projects to be undertaken immediately by the Municipal corporations, State Nodal Agencies or any other implementing Agency.

13. Close interaction should be maintained by the consultant with the State Nodal Agency Officials.

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