POLICIES RELATED TO CLEAN AND RENEWABLE ENERGY

The Government of India is playing an active role in promoting the adoption of RE by encouraging private sector investment and mandating the use of renewable resources. It is offering various incentives, such as GBIs and tax holidays, to encourage the development and use of RE sources. GoI has also created a liberal environment for foreign investment in RE projects. In addition to allowing 100% foreign direct investment (FDI), the government is encouraging foreign investors to set up RE-based power generation projects on a build-own-operate (BOO) basis in the country.
RE equipment prices have fallen dramatically due to technological innovation, increasing manufacturing scale and experience curve gains making RE cost competitive with fossil fuels. This is particularly true of solar and wind technology, where solar module prices have declined by almost 80% since 2008. Wind turbine prices have declined by nearly 30% during the same period [6]. Falling equipment prices have led to large-scale deployment of these technologies in India and globally.

SDG 7- Ensure access to Affordable, reliable, sustainable and Modern Energy to All

There is no development without fuelling the engine of growth. Energy is critical and people with no sustainable access to energy are deprived of the opportunity to become part of national and global progress. And yet, one billion people around the world live without access to energy. More than 781 million people in 2016, or 39% of the world's population, do not have access to clean fuels and technologies for cooking.

Why is this important?

The Secretary-General of the United Nations, Ban Ki-moon, has said, "Energy is the golden thread that connects economic growth, social equity, and environmental sustainability. With access to energy, people can study, go to university, get a job, start a business – and reach their full potential." Energy is central to nearly every major challenge and opportunity the world faces today – security, climate change, food production, jobs or increasing incomes. Sustainable energy generates opportunity – it transforms lives, economies and the planet. There are tangible health benefits to having access to electricity, and a demonstrable improvement in wellbeing. Energy access therefore constitutes a core component of the sustainable development agenda for energy. The production of useable energy can also be a source for climate change – accounting for around 60% of total global greenhouse gas emissions.

How can we address this? Goal 7 of the SDGs aims to correct this enormous imbalance by ensuring everyone has access to affordable, reliable, and modern energy services by the year 2030. To expand energy access, it is crucial to enhance energy efficiency and to invest in renewable energy. Asia has been the driver of progress in this area, expanding access at the twice the rate of demographic growth. 72% of the increase in energy consumption from modern renewable sources between 2010 and 2012 came from developing regions, including parts of Asia. Energy from renewable resources – wind, water, solar, biomass and geothermal energy – is inexhaustible and clean. Although the solution to energy's climate crisis lies off-grid, renewable energy currently constitutes only 15% of the global energy mix. It is time

for a new global partnership on sustainable energy for all, guided by Sustainable Development Goal 7 on universally accessible, efficient, clean, and reliable energy sources and services.

India and Goal 7

India is projected to be a significant contributor to the rise in global energy demand, around one-quarter of the total. However, as of 2016, more than 207 million people in India do not have access to electricity. The government's National Solar Mission is playing an important
role in the work towards renewable energy, and interventions in rural electrification and new ultra-mega power projects are moving India towards achieving universal energy access.

Targets for Goal 7

- By 2030, ensure universal access to affordable, reliable and modern energy services.
- By 2030, increase substantially the share of renewable energy in the global energy mix.
- By 2030, double the global rate of improvement in energy efficiency.
- By 2030, enhance international co-operation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology.
- By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing states and land-locked developing countries, in accordance with their respective programmes of support.

National Policy for Renewable Energy based Micro and Mini Grids

Objective

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.

The underlying principles of the policy

- 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.

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.

Types of Tariff and Revenues

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

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 renewable energy 38 energética india ·

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.

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.

Policy, Regulatory and Implementation level Interventions

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

National Tariff Policy

Government of India Ministry of New and Renewable Energy Off-grid and Decentralized Solar Thermal Application Scheme

Background

The Government had launched the **Jawaharlal Nehru National Solar Mission**, with the aim to focus on setting up an enabling environment for solar technology penetration in the country both at a centralized and decentralized level.

The first phase (up to March 2013) having achieved the required target and momentum, Solar Thermal component of JNNSM in balance period (UPTO MARCH 2022) will now, inter alia, would require focus on promoting off-grid systems including hybrid systems to meet / supplement heating and cooling energy requirements and power.

Challenges

The key challenge is to provide an enabling framework and support for entrepreneurs to develop markets. This scheme /programme will address off grid and decentralized solar thermal application area/systems.

Name of the scheme

The scheme will be known as '**Capital subsidy scheme for installation of solar thermal systems**'

Solar thermal applications/systems areas to be covered in this scheme

The heat produced from solar energy can be used for various applications in different sectors like process heating, drying, distillation/desalination, water heating, space heating and refrigeration and power/electricity generation.

Following systems may be considered for grant of capital subsidy in this scheme

(i) Solar water heating: A solar water heater (SWH) is a combination of an array of collectors, an energy transfer system and a thermal storage system.
(ii) Solar air heating Solar air heating (SAH) systems use air as the working fluid for absorbing and transferring solar energy. These systems are used for the production of hot air for drying/space-heating applications.
(iii) Solar steam generation/ pressurized hot water/air systems
(iv) Solar thermal refrigeration/cooling Solar cooling can be considered for two related processes: to provide refrigeration for food and medicine preservation, as well as to provide comfort cooling.
(v) Solar Thermal Power Pack (including hybrid with Solar PV) Concentrating Solar Power (CSP) technologies
(vi) Solar stills

Objectives:

- To promote off-grid applications of solar Thermal systems(solar water/air heating system, solar cooker, solar concentrating system, solar thermal power pack are covered for meeting the targets set in the Jawaharlal Nehru National Solar Mission .
- To create awareness and demonstrate effective and innovative use of solar thermal systems for individual/ community/ institutional/ industrial applications
- To encourage innovation in addressing market needs and promoting sustainable business models.
- To provide support to channel partners and potential beneficiaries, within the framework of boundary conditions and in a flexible demand driven mode.
- To create a paradigm shift needed for commoditization of off-grid decentralized solar thermal applications
- To support consultancy services, seminars, symposia, capacity building, awareness campaigns, human resource development, etc.

Mode of Implementation

The programme would be implemented through multiple agencies - State Nodal Agencies/Deptts. implementing the renewable energy programmes, Solar Energy Corporation of India, Channel Partners and other Govt. organizations i.e., PSUs/Institutions/State Departments/Local Governments/Municipal Corporations/NHB/NABARD/IREDA etc

Central Financial Assistance and Fiscal Incentives

CFA for Biomass Power Project and Bagasse Cogeneration Projects by Private/Joint/Coop./Public Sector Sugar Mills

Project Type	Capital Subsidy
Biomass Power projects	Rs.20 lakh X (C MW)^0.646
Bagasse Co-generation by Private sugar mills	Rs.15 lakh X (C MW)^0.646
Bagasse Co-generation projects by cooperative/ public sector sugar mills 40 bar & above 60 bar & above 80 bar & above	Rs.40lakh * Rs.50lakh * Rs.60lakh * Per MW of surplus power@ (maximum support Rs. 8.0 crore per project)

CFA for Bagasse Cogeneration Project in cooperative/ public sector sugar mills implemented by IPPs/State Government Undertakings or State Government Joint Venture Company / Special Purpose Vehicle (UrjaAnkur Trust) through BOOT/BOLT model

PROJECT TYPE	CAPITAL SUBSIDY

Single coop. mill through BOOT/BOLT Model MINIMUM CONFIGURATION 60 bar & above 80 bar & above	Rs.40 L/MW of surplus power *Rs.50 L/MW of surplus power*(maximum support Rs.8.0 crore/ sugar mill)

CFA for Bagasse Cogeneration Project in existing cooperative sector sugar mills employing boiler modifications

PROJECT TYPE	CAPITAL SUBSIDY
Existing Cooperative Sugar Mill MINIMUM CONFIGURATION 40 bar & above 60 bar & above80 bar & above	Rs.20 L/MW of surplus power * Rs.25 L/MW of surplus power* Rs.30 L/MW of surplus power* (** Power generated in a sugar mill (-) power used for captive purpose i.e. Net power fed to the grid during season by a sugar mill. CFA will be provided to the sugar mills who have not received CFA earlier from MNRE under any of its scheme.*)

National Policy on Biofuels

1.0 PREAMBLE

1.1 India is one of the fastest growing economies in the world. The Development Objectives focus on economic growth, equity and human well being. Fossil fuels will continue to play a dominant role in the energy scenario in our country in the next few decades.On the other hand, renewable energy resources are indigenous, non-polluting and virtually inexhaustible. India is endowed with abundant renewable energy resources. Therefore, their use should be encouraged in every possible way.

1.2 The crude oil price has been fluctuating in the world market and has increased significantly in the recent past, reaching a level of more than $ 140 per barrel. Petro-based oil meets about 95% of the requirement for transportation fuels, and the demand has been steadily rising. The domestic crude oil is able to meet only about 23% of the demand, while the rest is met from imported crude.

1.3 India's energy security would remain vulnerable until alternative fuels to substitute/supplement petro-based fuels are developed based on indigenously produced renewable feedstocks

1.4 Biofuels are derived from renewable bio-mass resources and, therefore, provide a strategic advantage to promote sustainable development and to supplement conventional energy sources in meeting the rapidly increasing requirements for transportation fuels associated with high economic growth, as well as in meeting the energy needs of India's vast rural population..

2.0 THE VISION AND GOALS

2.1 The Policy aims at mainstreaming of biofuels and, therefore, envisions a central role for it in the energy and transportation sectors of the country in coming decades. The Policy will bring about accelerated development and promotion of the cultivation, production and use

of biofuels to increasingly substitute petrol and diesel for transport and be used in stationary and other applications, while contributing to energy security, climate change mitigation, apart from creating new employment opportunities and leading to environmentally sustainable development.

2.2 The Goal of the Policy is to ensure that a minimum level of biofuels become readily available in the market to meet the demand at any given time. An indicative target of 20% blending of biofuels, both for bio-diesel and bio-ethanol, by 2017 is proposed. Blending levels prescribed in regard to bio-diesel are intended to be recommendatory in the near term. The blending level of bio- ethanol has already been made mandatory, effective from October, 2008, and will continue to be mandatory leading upto the indicative target.

3. 0 DEFINITIONS AND SCOPE

3.1 The following definitions of biofuels shall apply for the purpose of this Policy:

i. 'biofuels' are liquid or gaseous fuels produced from biomass resources and used in place of, or in addition to, diesel, petrol or other fossil fuels for transport, stationary, portable and other applications; ii. 'biomass' resources are the biodegradable fraction of products, wastes and residues from agriculture, forestry and related industries as well as the biodegradable fraction of industrial and municipal wastes.

3.2 The scope of the Policy encompasses bio-ethanol, bio-diesel and other biofuels, as listed below:-

ii. 'bio-ethanol': ethanol produced from biomass such as sugar containing materials, like sugar cane, sugar beet, sweet sorghum, etc.; starch containing materials such as corn, cassava, algae etc.; and, cellulosic materials such as bagasse, wood waste, agricultural and forestry residues etc. ;

iii. 'biodiesel': a methyl or ethyl ester of fatty acids produced from vegetable oils, both edible and non-edible, or animal fat of diesel quality; and ,

iv. other biofuels: biomethanol, biosynthetic fuels etc.

NATIONAL WIND-SOLAR HYBRID POLICY

1. INTRODUCTION

1. India has set an ambitious target of reaching 175 GW of installed capacity from renewable energy sources by the year 2022, which includes 100 GW of solar and 60 GW of wind power capacity. At the end of 2017-18 the total renewable power installed capacity in the country was almost 70 GW.
2. Solar and wind power being variable in nature pose certain challenges on grid security and stability. Studies revealed that in India solar and wind resources are complementary to each other and hybridization of these two technologies would help in minimizing the variability apart from optimally utilizing the infrastructure including land and transmission system.

3. Superimposition of wind and solar resource maps shows that there are large areas where both wind and solar have high to moderate potential.
4. The existing wind farms have scope of adding solar PV capacity and similarly there may be wind potential in the vicinity of existing solar PV plant.
5. Suitable policy interventions are therefore, required not only for new wind-solar hybrid plants but also for encouraging hybridization of existing wind and solar plants.
6. To smoothen the wind solar hybrid power further, appropriate capacity of battery storage may also be added to the project.

2. AIMS AND OBJECTIVE

1. The main objective of the Policy is to provide a framework for promotion of large grid connected wind-solar PV hybrid system for optimal and efficient utilization of transmission infrastructure and land, reducing the variability in renewable power generation and achieving better grid stability.
2. Policy also aims to encourage new technologies, methods and way outs involving combined operation of wind and solar PV plants.

3. PERIOD OF ENFORCEMENT -This policy will remain in force unless withdrawn, modified or superseded by the Government. The Government will undertake a review of this Policy as and when required.

4. WIND-SOLAR HYBRID SYSTEMS

1. Under the category of wind-solar hybrid power plants, Wind Turbine Generators (WTGs) and Solar PV systems will be configured to operate at the same point of grid connection. There can be different approaches towards integrating wind and solar depending upon the size of each of the source integrated and the technology type.
2. In case of fixed speed wind turbines connected to grid using an induction generator, the integration can be on the HT side at the AC output bus. However, in case of variable speed wind turbines deploying inverters for connecting the generator to the grid, the wind and the Solar PV system can be connected to the intermediate DC bus of the AC-DC-AC converter.
3. The second important aspect would be related to the sizing – which would depend on the resource characteristics. In order to achieve the benefits of hybrid plant in terms of optimal and efficient utilization of transmission infrastructure and better grid stability by reducing the variability in renewable power generation, in the locations where the wind power density is quite good, the size of the solar PVs capacity to be added as the solar-hybrid component could be relatively smaller. On the other hand, in case of the sites where the wind power density is relatively lower or moderate, the component of the solar PV capacity could be relatively on a higher side. However, a wind-solar plant will be recognized as hybrid plant if the rated power capacity of one resource is at least 25% of the rated power capacity of other resource.

5. IMPLEMENTATION STRATEGY

5.1 The implementation of wind solar hybrid system will depend on different configurations and use of technology.

i. Wind-Solar Hybrid- AC integration
ii. Wind-Solar Hybrid- DC integration

5.2 New Wind-Solar Hybrid Plants:

New wind-solar hybrid projects shall be encouraged with following provisions:-

i. The hybrid power generated from the wind-solar hybrid project may be used for

   b. captive purpose;
   c. sale to third party through open access;
   d. sale to the distribution company (ies) either at tariff determined by the respective SERC or at tariff discovered through transparent bidding process; and
   e. sale to the distribution company (ies) at APPC under REC mechanism and avail RECs.

ii. The power procured from the hybrid project may be used for fulfilment of solar RPO and non-solar RPO in the proportion of rated capacity of solar and wind power in the hybrid plant respectively.

iii. For procurement of hybrid power through transparent bidding process different parameters may be used. Parameters that may be considered for bidding could be capacity delivered at grid interface point, effective CUF and unit price of electricity.

5.3 Hybridisation of existing wind/solar PV plants:

Existing wind or solar power projects, willing to install solar PV plant or WTGs respectively to avail benefit of hybrid project, may be allowed to do so with following Conditions:

i. No additional connectivity/transmission capacity charges shall be levied by the respective transmission entity for hybridisation at existing wind/solar PV plants if already granted transmission connectivity/ access is being used. Transmission charges may be applicable for the additional transmission capacity/ access granted as per prevailing regulation.
ii. In case capacity margins are available at the receiving transmission sub-station of respective transmission entity, at which the existing wind/solar projects is connected, additional transmission capacity/access may be allowed subject to its technical feasibility.

iii. The additional solar/wind power generated from the hybrid project may be used for
   (a) captive purpose;
   (b) sale to third party through open access;
   (c) sale to the distribution company (ies) either at tariff determined by the respective SERC or at tariff discovered through transparent bidding process; and
   (d) sale to the distribution company (ies) at APPC under REC mechanism and avail RECs.

iv. Government entities may invite bids for hybridisation of existing wind and solar plants with tariff being the main criteria for selection.

v. The additional solar/wind power procured from hybrid project shall be used for fulfilment of solar/non-solar RPO as the case may be.

5.4 Battery Storage:

Battery storage may be added to the hybrid project

a. To reduce the variability of output power from wind solar hybrid plant;
b. Providing higher energy output for a given capacity (bid/ sanctioned capacity) at delivery point, by installing additional capacity of wind and solar power in a wind solar hybrid plant;
c. Ensuring availability of firm power for a particular period. Bidding factors for wind solar hybrid plants with battery storage may include minimum firm power output throughout the day or for defined hours during the day, extent of variability allowed in output power, unit price of electricity, etc.
d.

Biomass Power and Cogeneration Programme

Introduction

Ministry of New and Renewable Energy has realised the potential and role of biomass energy in the Indian context and hence has initiated a number of programmes for promotion of efficient technologies for its use in various sectors of the economy to ensure derivation of maximum benefits **.**

Biomass power & cogeneration programme is implemented with the main objective of promoting technologies for optimum use of country's biomass resources for grid power generation. Biomass materials used for power generation include bagasse, rice husk, straw, cotton stalk, coconut shells, soya husk, de-oiled cakes, coffee waste, jute wastes, groundnut shells, saw dust etc.

Potential

The current availability of biomass in India is estimated at about 500 millions metric tonnes per year. Studies sponsored by the Ministry has estimated surplus biomass availability at about 120 – 150 million metric tones per annum covering agricultural and forestry residues corresponding to a potential of about 18,000 MW. This apart, about 5000 MW additional power could be generated through bagasse based cogeneration in the country's 550 Sugar mills, if these sugar mills were to adopt technically and economically optimal levels of cogeneration for extracting power from the bagasse produced by them**.**

Indian Renewable Energy Development Agency (IREDA) provides loan for setting up biomass power and bagasse cogeneration projects.

National Biomass Cook stoves Programme (NBCP)

Background

In the context of concerns over health, climate change and energy security, the Ministry of New and Renewable Energy through a Special Project on Cookstove(SPC) during 2009-10 initiated the process of consultations under its Core Group on cookstoves to ascertain the status of various types of biomass improved cookstoves being developed and promoted by various organizations, NGOs, entrepreneurs and industries in the country, and to identify ways and means for the development and expansion of the deployment of improved biomass cookstoves. The consultations indicated that biomass cookstoves do have the potential to directly address health and welfare concerns of the weakest and most vulnerable sections of society. The cleaner combustion in these devices will also greatly reduce greenhouse pollutants.

1. National Biomass Cookstoves Initiatives (NBCI)

As a result of the above consultations, a National Biomass Cookstoves Initiative (NBCI) was launched by MNRE on 2nd December 2009 at New Delhi with the primary aim to enhance the use of improved biomass cookstoves.

2. Unnat Chulha Abhiyan Programme

As follow up to the National Biomass Cook-stove Initiative (NBCI), the Ministry initiated a new proposal for promoting the development and deployment of Unnat Chulhas (Biomass Cookstoves) in the country during the 12th Plan Period for a budgetary cost of Rs. 294/- crores appraised and recommended by the Expenditure Finance Committee.

Accordingly the Administrative Approval with detailed Guidelines for the UnnatChulhaAbhiyan were formulated and issued on 27th June 2014.

Objectives

i. To develop and deploy improved biomass cook-stoves for providing cleaner cooking Energy solutions in rural, semi-urban and urban areas using biomass as fuel for cooking.
ii. To mitigate drudgery of women and children using traditional chulha for cooking.
iii. To mitigate climate change by reducing the black carbon and other emissions resulting from burning biomass for cooking.

A target of 2.75 million improved cookstoves/ chulhas waswaswas disseminated/installed in the remaining period of the 12th Plan Period .

Ujjala Yojana

Key Features of UJALA

- Unnat Jyoti by Affordable LEDs for All (UJALA) scheme was launched on May 1, 2015 to promote efficient use of energy at residential level and enhance consumer awareness on using efficient equipment to reduce electricity bills and help preserve the environment.
- The scheme promotes the use of LED bulbs as a substitute to incandescent bulbs, tube lights and CFL bulbs.

- LED bulbs under UJALA are distributed at subsidized rates through special counters only set up at designated places in different cities across the country.

The Need for UJALA Yojana

As per a study conducted by the Ministry of Environment and Forest in 2011, lighting consumption constituted about 30 percent of overall residential energy consumption. The main lighting options in Indian households comprised of Incandescent Light (ICLs) bulbs, Tube-lights (Fluorescent lamps) and CFLs.

The consumers availing bulbs under UJALA can save nearly INR 336 every year on their electricity bills per LED bulb. 3 UJALA – 'A Way to Light' Under the scheme, the Government's target is to replace all 77 crore inefficient bulbs in the country with LED bulbs by 2019, which would result in an annual reduction of 20,000 MW load and Green House Gas reduction of 80 million tonnes every year.

The 3 states yet to adopt the scheme are Arunachal Pradesh, Tripura and Manipur. The details of UJALA LED bulbs are stated below.

For 2016-17, the Government of India is confident of distributing an additional 20 crore LED bulbs. Sustained efforts under UJALA, coupled with industry support, will help the government achieve its objective of replacing 77 crore inefficient bulbs by March 2019.

Jharkhand Solar Policy 2015

Policy, which was revised in the year 2017, aims to push Jharkhand's total solar power production capacity to 2,650 MW by the year 2020, including large scale and rooftop solar plants.

Jharkhand Solar Energy Policy Updates 2017

A 50 percent subsidy to residential consumers and a 10 percent subsidy to commercial (industrial) consumers installing rooftop solar will be provided by the Jharkhand State government, the policy was implemented in July 2017.

Objective

- To encourage participation of private sector to set up solar power based projects in the state & increase solar power generation to 2650MW by the year 2020in a phased manner.
- To build favorable atmosphere for setting up solar power projects.
- Ensure energy security of the state by stable and non-pollution means.
- To promote local manufacturing facilities which will generate employment in the state

APPLICABILITY

Solar Parks

The State shall promote development of solar park on non-productive Government land or any other land falling within the area of solar park. State Government will identify land for the development of Solar Parks. The State Electricity Regulatory Commission shall develop suitable framework to ensure successful development of Solar Parks in the State.

The State Government, under this Policy, will help facilitate in building up the necessary infrastructure like power evacuation infrastructure, water requirements and internal road etc. Solar Park will consist of various zones viz. Solar Power Projects, Manufacturing Zones, R&D and training centres. The state will extend all facilities and fiscal incentives provided by central Govt. / National Solar Mission to the Manufacturers and Power Project Developers in Solar Park.

Solar Power Plants on Canals

The State is promoting development of Solar Power Plants on the Canal Top and on the banks of canal, after undertaking its technical feasibility. In addition, the Nodal Agency shall coordinate with the Ministry of New and Renewable Energy for implementation of its scheme announced from time to time.

Rooftop Solar Power Plants

Jharkhand government is encouraging implementation of the minimum target spe-cified for rooftop solar photovoltaic power plants, connected with electricity system.

Solar Thermal Power Plants

Eligibility Criteria

All registered companies/ firms/societies, government entities, consumers of Discom(s) and individual will be eligible for setting up of solar power projects within the state for sale of electricity / captive use, in accordance with the electricity Act 2003 as amended from time to time.

Security

For projects for sale of power to Discoms of Jharkhand, security deposit will be governed by provisions in the bid document and PPA.

For plants under REC mechanism, captive use, third party sale/sale to other state through Open Access, the developer shall have to deposit security amount of Rs. 30.00 lakh/MW in the form of bank guarantee within one month from the date of issue of in-principle clearance/approval of the project by JREDA, failing which the approval of the project shall automatically stand cancelled.

Security amount deposited shall not be convertible or transferable and shall be refunded within 30 days after receipt of written request from the developer after Commissioning of the project.

In case the developer fails to commission the power plant within the time schedule, the security deposit shall be forfeited.

Incentives

i. SPP to be treated as industry. Intra-state Open Access for tenure of the project or 25 years whichever is earlier. Equipment exempted from VAT, Electricity duty, Cross Subsidy Surcharge. Exempted for Distribution Losses for projects injecting at 33 kV or below.
ii. Remote Village Electrification programme: progress by Jharkhand Renewable Energy Development Agency JREDA programmes for off-grid RE devices including cooking energy solutions.

Project on Hybrid System (Solar & Wind) in Lapung, Ranchi

JREDA on the vase of converting more and more energy from renewable sources is now focusing on hybrid system for generation of electricity

IIT Madras has got approval from MNRE of solar energy corporation of India department to work and research for the term of 2 years and submit the report and find the possibility of electricity generation and potential with the help of JREDA.

Solar Power Plant in Sikidiri, Ranchi

JREDA is going to set up 2MW of electricity generation on Canal Top Plant at Sikidri, about 39 KMs from the state capital. It would be providing electricity to near about 1000 households.

Solar Energy Efficient Jharkhand new Assembly Building

Prime Minister Narendra Modi recently inaugurated the new building of Jharkhand Assembly. The new Jharkhand Assembly premises is the first in the country which will be entirely paperless. For energy efficiency, 300 KVA two solar power systems have been installed through which power will be supplied to new building. Sources said that the new Assembly building will meet 40 per cent of its power requirement through renewable energy.

Though India has enormous potential for renewable energy, and as of today, renewable energy based power generation constitutes 7% of the total installed capacity in the country for power generation from all sources. The Ministry of Nonconventional Renewable Energy (MNRE) has estimated an aggregate of over 150,000 MW and only 10 % installed capacity has been achieved so far as against the estimated renewable energy based grid connected power potential. This warrants the strong actions to be taken for achieving self-sustenance in energy requirements. Policy push for renewable through RPO / REC and decentralized renewable energy well-suited for Jharkhand

Solar Policies and It's Highlights

Jharkhand Solar Policy and it's Solar Highlights

The above solar policy of Jharkhand was published on August 10, 2015 .
Jharkhand is located in the eastern part of India and was formed in the year 2000 as a part of Bihar. Cities such as Ranchi, Jamshedpur, Dhanbad and Bokaro are cities of great industrial importance.

As of 2017, Jharkhand had a commissioned solar power of 17.51MW with 1.33 MW coming in the FY 2016/17. In order to push solar, Jharkhand announced its solar policy in 2015 to achieve up to 2650MW grid connected solar power by the year 2020. 500MW out of this 2650MW is earmarked to be achieved from rooftop solar power plants. There were reports of delay in the signing of PPA of projects of up to 1200MW at 45 different sites in Jharkhand last year, which were mainly due to the government having second thoughts about the agreed tariffs. This 1.2GW project is set to be the biggest in Jharkhand so far but seems to be struggling to get off the ground highlighting the issues that exist in certain states due to their geography and financial state.

1**. NET METERING**

Capacity

- Min 1 kWp
- Max 1 MWp

Conditions:

- 100% of your Sanctioned Load
- Cumulative capacity of all solar systems installed in your area shall not exceed 15% of distribution transformer capacity in your area.

Ownership options

- Self ownership (CAPEX model)
- Third party ownership (RESCOmodel)

Billing Mechanism

- Annual (April to March)

Others

- Exemption from wheeling charges and cross subsidy surcharge
- If the electricity generated exceeds 90% of the electricity consumed at the end of the settlement period, no payment shall be made by the distribution licensee and shall not be carried forward to next settlement period
- 100% banking of energy permitted during all 12 months for renewable energy projects.

2. SUBSIDY

- Subsidy Applicable as per SECI guidelines.

3. LOAN AVAILABILITY

- Loan for solar as a part of home loan/home improvement loan
- Loan upto Rs. 10 lacs available for individuals under Priority sector lending

Bihar Solar Policy and it's Solar Highlights

Bihar is the third most populated state in India and is located in the eastern part of the country. While the state has made significant progress towards development, it still is considered to be lagging behind some of the other more glamorous states in the country when it comes to socio-economic development.

Bihar has a total commissioned solar power of about 95.91 MW, with 90.81MW being added just in the last one year. This clearly reiterates the commitment towards going solar for the state. In fact, Dharnai, a village with 2400 people, 450 homes and 50 commercial establishments in Bihar became the first fully solar powered village in India in 2015. Dharnai has since become an inspiration to several other villages in the country, which still do not have access to power 24x7. Given the dense population of the state, and lack of available land, rooftop solar is the perfect solution for the state of Bihar. In the past, Bihar Renewable Energy Development Agency or BREDA has run several subsidy lead programs to ensure that people are encouraged to go solar, the falling prices of solar ensure that by 2017, even without subsidy, going rooftop solar makes a lot of financial as well as environmental sense.

1. NET METERING

NET METERING (Net metering is a billing system that allows rooftop owners having solar system installed at their rooftop to sell any excess electricity generated from solar system to local electricity utility)

Capacity

- 50 kWp to 1 MWp

Conditions

- 100% of your Sanctioned Load
- Cumulative capacity of all solar systems installed in your area shall not exceed 40% of distribution transformer capacity in your area.

O**wnership options**

- Self ownership (CAPEX model)
- Third party ownership (RESCO model)

Billing Mechanism

- Annual (April to March)
- Any unadjusted electricity credits shall be paid as per the rates notified by CSERC.

2. SUBSIDY

- Subsidy Applicable as per SECI guidelines.

LOAN AVAILABILITY

- Loan for solar as a part of home loan/home improvement loan
- Loan upto Rs. 10 lacs available for individuals under Priority sector lending

Chhattisgarh Solar Policy and it's Solar Highlights

Formed in the year 2000, the state of Chattisgarh is one of the fastest developing states in India. It is the 10th largest state in the country and is a prime producer of electricity and steel in the country. Chattisgarh is located in the Southern-eastern region of India. Despite its relatively young age, Chattisgarh already has a total of**135.19MW commissioned solar power**. Out of this, 4*1.61MW was commissioned* in the last year of 2016/17 alone. In the year 2016, Chattisgarh government had decided to set up 51,000 solar powered irrigation pumps by the year 2019 in a major push for solar. It is expected that Chattisgarh would add 2640 MW renewable energy by the end of the FY 2018/19. Raipur

and Bilaspur in Chattisgarh have already been mandated to be developed as solar cities under the 'Development of Solar Cities Programme'. There are in total 55 such cities in India. Chattisgarh is one of the leading states in off-grid solar projects and has more than 50MW off grid power, with several medical colleges, public schools and engineering colleges installing rooftop off grid systems. With a continuous push, the picture for Chattisgarh is only going to get rosier.

West Bengal Solar Policy and it's Solar Highlights

West Bengal, contrary to its name, is located in the Easter part of India and is one of the most populated stated in the country. The capital city of West Bengal os Kolkata, which was famously called as Calcutta in the time of British rule. The city was seen as a city of major importance for the Britishers, especially for trade and other economical reasons. West Bengal has about 23.07MW of connected solar power as of January 2017. Out of this more than 50%, 15.30MW to be exact was commissioned in the Financial Year 2016/17. In the year of 2016, more than 190 schools in West Bengal saw solar power systems installed. The state government has ambitious plans and more than 1300 government buildings, hospitals and schools have been identified to help install about 180MW of solar in the next couple of years. The target for theFinancial year 2017-18 has been set at 120MW and the government in all is expected to spend about Rs 1000 crore overall on the project. Not just the villages and cities, but also the islands of Sundervans have been discussed as areas that are currently facing a shortage of power. Solar as a possible solution is attractive but the difficulty in land acquisition for projects has put the state behind. A new policy too is expected in West Bengal to help set up the action plan, helping the state to achieve the target of 4,500MW of solar power by the year 2022 that the state has set.

CAPEX MODEL - Consumer purchases the solar energy plant and get it installed on their premises by the installer companies its called CAPEX model.

After that they receive all of the electricity savings and available subsidies. They also get solar renewable energy certificates and eligible to get other local scheme.

RESCO MODEL - RESCO model, a developer finances, installs, operates and maintains the rooftop solar power plant on the consumer's roof. The developer signs a **power purchase agreement (PPA)** with the rooftop owner.