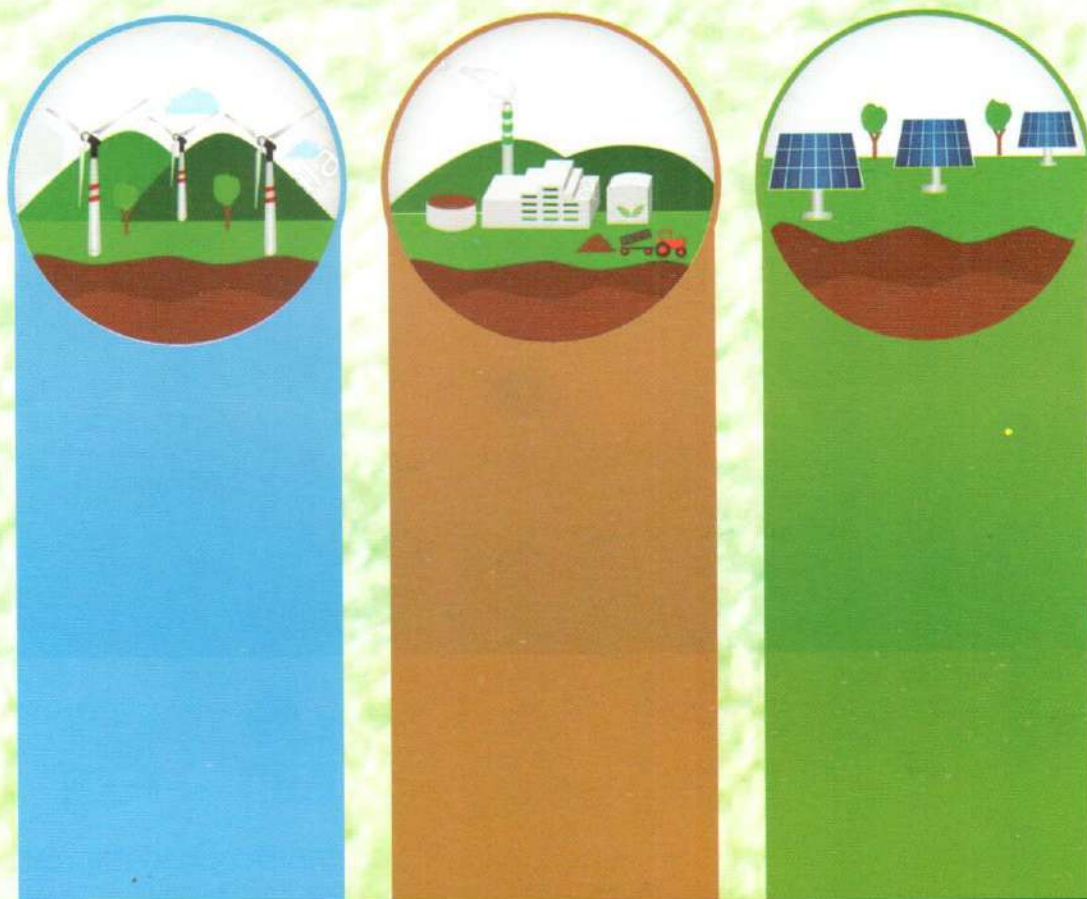


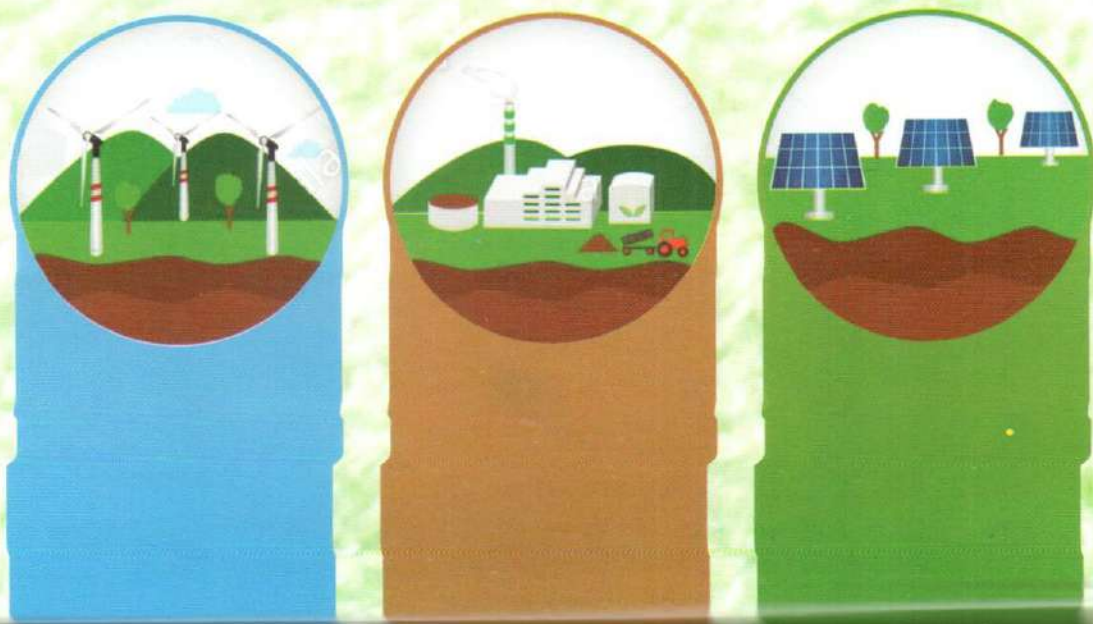
Bihar Policy for Promotion of Bihar New and Renewable Energy Sources 2017



Energy Department, Government of Bihar



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ABBREVIATIONS

ABT	:	Availability Based Tariff
BIADA	:	Bihar Industrial Area Development Authority
BREDA	:	Bihar Renewable Energy Development Agency
BSHPCL	:	Bihar State Hydroelectric Power Corporation Limited
BSPHCL	:	Bihar State Power Holding Company Limited
BOOM	:	Build. Own, Operate & Maintain
CEA	:	Central Electricity Authority
BERC	:	Bihar Electricity Regulatory Commission
DPR	:	Detailed Project Report
DISCOM	:	Distribution Company
EPC	:	Engineering, Procurement, and Construction
ESCO	:	Energy Service Company
FiT	:	Feed in Tariff
FY	:	Financial Year
GoI	:	Government of India
GSS	:	Grid Sub-Station
GST	:	Goods & Service Tax
GW	:	Giga Watt
JNNSM	:	Jawaharlal Nehru National Solar Mission
JV	:	Joint Venture
KW	:	Kilo Watt
MNRE	:	Ministry of New and Renewable Energy, GOI
MW	:	Mega Watt
NBPDCL	:	North Bihar Power Distribution Company Limited
NGO	:	Non-Government Organization
NTPC	:	National Thermal Power Corporation
NVVN	:	NTPC Vidyut Vyapar Nigam
PLF	:	Plant Load Factor
PPA	:	Power Purchase Agreement
PSS	:	Power Sub-Station
PV	:	Photo Voltaic
REC	:	Renewable Energy Certificate
RPO	:	Renewable Purchase Obligation
SBPDCL	:	South Bihar Power Distribution Company Limited
SECI	:	Solar Energy Corporation of India
SERC	:	State Electricity Regulatory Commission
SHP	:	Small Hydro Project
SPV	:	Special Purpose Vehicle
SIPB	:	State Investment Promotion Board
SNA	:	State Nodal Agency
VGF	:	Viability Gap Funding

Government of Bihar, Energy Department Resolution

Letter No Pra02/BREDA/Apra Niti-11/08

Patna, Dated

1. Preamble

Renewable Energy including solar, wind, biomass, etc. are not just different sources of energy, but more importantly, tools to address several pressing needs such as improving energy security and access; reducing the health and environmental impacts associated with fossil fuels; and mitigating greenhouse gas emissions. Government of India has committed for the renewable sources to cover 40% of country's power generation by the year 2030. Such a feat implies that the country will require to achieve an installed RE capacity of 175GW by the year 2022. This includes 100 GW of solar power, 60 GW of wind power, 15 GW of biomass and the rest covered by hydro power.

To ensure that this target is achieved in due time, it is imperative for all the states in India to actively participate in deploying renewable energy sources and become self-sustainable in terms of their energy demand.

Bihar is one of the fastest growing states in India. The rapid economic growth and infra structural development in the state needs to be supported by a proportionate growth in electricity generation. The current installed power capacity in Bihar stands at 2984.79 MW (Mar 2016), with coal contributing to almost 92% of the installed power capacity. With its large population and rapidly growing economy, Bihar needs access to clean, cheap and reliable sources of energy. Giving the due cognizance to the issue at hand, state government has targeted to provide 24 hours electricity connections to all rural and urban households by 2018-19. Attaining such an ambitious target will require a complete transformation of power sector scenario in Bihar including the tapping of a huge renewable energy potential.

Besides addressing energy demand and access issues, the renewable energy industry will also attract foreign investments which will create several job opportunities in Bihar. The renewable energy industry provides both one-time job opportunity which is during the pre-commissioning/ construction phase, and also permanent operations and maintenance positions that sustain over the life of the projects. Investments in renewable energy deployment as well as manufacturing of renewable products will help create direct and indirect employment opportunities in both skilled and unskilled sector.

Government of Bihar had issued the Bihar Policy for promotion of New and Renewable Energy Sources 2011, vide Letter No.PRA-02/BREDA-APRA NITI-11/08/2845 Dt.24/06/2011. Post completion of the operative period of previous policy and recognizing the true potential of renewable energy in meeting the energy demand, providing access to energy and creating many local jobs, a revised 'Policy for Promotion of New and Renewable Energy Sources, 2017' has been in alignment to central and state government's targets.



2. Legislative Framework of the Policy

The provision of Electricity Act, 2003 mandates the Central and State Government to take necessary steps for promotion of renewable energy in the country including policy framework design. Accordingly, the Government of Bihar is exercising its power of promoting Renewable Energy in the state through this Renewable Energy Policy.

This policy supersedes the previous policy i.e. "Bihar Policy for promotion of New and Renewable Energy Sources 2011", issued in 2011 vide Letter No.PRA-02/BREDA-APRA NITI-11/08/2845 Dt.24/06/2011.

3. Operative Period

The policy shall remain in operation for a period of 5 years from the date of the notification or till the State Government notifies the new policy. The Policy will be evaluated for impact assessment at least once during this policy period. The review will ensure inclusion of any new renewable technology that may evolve over the next few years. The second evaluation will be undertaken during FY 2022 with an objective of conducting a decision making assessment over policy continuation or extension. For giving effect to this policy, necessary amendments in various policies, rules & regulations, wherever necessary, shall be expeditiously undertaken by the concerned departments.

4. Nodal agency

Bihar Renewable Energy Development Agency (BREDA) will be the key agency for all renewable projects, except for small/ micro/ mini hydro projects, for which Bihar State Hydroelectric Power Corporation Limited (BSHPCL) shall be the nodal agency. The Energy Department, Government of Bihar, has the authority to nominate the nodal agency/implementing agency for different sub-sectors concerned with solar energy.

5. Policy Objectives

- (a) To target installed capacity of 2969 MW solar, 244 MW Biomass & Bagasse cogeneration and 220 MW small hydro power by 2022 in the state with an objective to meet the growing demand for power in an environmentally sustainable manner
- (b) To attract private sector participation including foreign players in solar energy sector by providing conducive environment for setting up grid connection as well as decentralized renewable energy projects
- (c) To provide decentralized renewable energy for agriculture, industry, commercial and household sector particularly in rural areas thereby improving the quality of power
- (d) To support R&D, demonstration and commercialization of new and emerging technologies/applications



- (e) To promote local manufacturing to contribute economic growth in the state
- (f) To facilitate imparting necessary skills and capacity building in establishing, operating and managing RE projects to generate indirect employment opportunities for local population

6. Eligible Developers

All registered companies, Government entities, partnership companies/ firms, Individuals, Consortia, Panchayat Raj Institutions, Urban Local Bodies, Co-Operative or Registered Society and all consumers of Bihar state distribution companies will be eligible for setting up of RE Projects within the state for sale of electricity/captive use, in accordance with the Electricity Act-2003, as amended from time to time. The entity desiring to set up Renewable Power Project shall intimate the Nodal Agency as per Para 4 of this policy.

7. Thrust areas

7.1. Grid connected solar

Para 6.4(i) of the revised National Tariff Policy notified vide resolution No. 23/2/2005-R&R (Vol- IX) and published in the Gazette of India on 29 January 2016 states that the long term growth trajectory of Renewable Purchase Obligations (RPOs) will be prescribed by the Ministry of Power in consultation with Ministry of New and Renewable Energy (MNRE); and within the percentage so made applicable, to start with, the SERCs shall also reserve a minimum percentage for purchase of solar energy from the date of notification of this policy which shall be such that it reaches 8% of total consumption of energy, excluding Hydro Power by March 2022 or as notified by the central government from time to time.

In order to fulfil 8% solar RPO by 2022, and contribute to achieve a 100 GW target of the Government of India, MNRE has set a capacity target of 2969 MW for Bihar to be achieved by 2022.

Bihar offers several options for sale of power to solar energy generators, permitting the investors with different risk-return profiles to participate in the market.

- (a) **Sale of power to DISCOM (Projects size >2 MW):** Solar power producers may sign a long-term Power Purchase Agreement (PPA) with state distribution companies at fixed tariffs, albeit these shall be determined through competitive bidding and shall help distribution companies fulfil their RPOs.

Additionally, state government will encourage developers to take part in business models under Jawaharlal Nehru National Solar Mission including bundling of solar power with coal based/thermal power and Viability Gap Funding (VGF) facilitated by NTPC/NVVN and SECI respectively. A Power Purchase Agreement will be signed between NTPC/NVVN/SECI and the Project Developers backed by a Power Sale Agreement between NTPC/NVVN/SECI and state distribution companies (DISCOMs).



- (b) **Sale of power to DISCOM (Projects size ≤ 2 MW):** There are sub-stations at various locations in the state which have capacities to absorb certain quantities of extra power without any up-gradation. Injection of small capacities of power into these sub-stations would result in better grid stability, better power availability and no extra cost in upgrading the transmission network. These small solar based power plants would be most effective to accomplish multiple goals of solar deployment as well as job creation for the local population. Most of the areas in the state have enough solar radiation for setting up solar power plants. Therefore, any location where land is available within 5 kilometers of nearest sub-stations and having spare capacity to absorb power can be used for development of solar power plants very economically and sufficiently. The responsibility of connection to the nearest sub-station and associated charges thereof shall be responsibility of the project developer.

Under this scheme, project size between 0.5 MW to 2 MW in multiple of 100 kW (peak AC output at the interconnection point) shall be allowed to be set up by land owning farmers, cooperatives, Societies, Gram Panchayats, Block Panchayat, municipalities, MSME units, existing Industrial units, etc. for sale of power to distribution companies (DISCOM) through competitive bidding or at BERC determined tariff on first come first served basis subject to the requirement for fulfilling the RPO.

- (c) **Sale through Renewable Energy Certificates (REC) mechanism:** The state shall encourage solar project developers to set up solar projects under REC mechanism. The power from the projects shall be purchased by the state distribution companies at average pooled power purchase cost as determined by BERC. The project developer shall follow the procedure of registration, accreditation of the project and subsequent issuance and trading of RECs as per the respective guidelines/regulations/orders of CERC/BERC.
- (d) **Sale of power to Captive consumers, 3rd party or outside state through open access:** The state shall promote solar project developers to set up solar projects for captive use, or sale of power to 3rd party, or to states other than Bihar through open access mode. Arrangement of wheeling, transmission, banking and applicability of charges like open access charges, cross subsidy surcharge shall be as per guidelines/regulations/orders of BERC.

7.2. Grid connected Rooftop solar PV

The Government of Bihar promotes deployment of rooftop solar PV projects, keeping into consideration the potential benefits of deployment of rooftop solar PV projects, optimal utilization of spaces on rooftops, savings on investment in transmission and distribution infrastructure, savings on reducing the network losses, reduced cost for managing the scheduling of electricity etc. Of the targeted capacity of 2969 MW solar in Bihar, the policy targets 1000 MW from grid connected solar rooftop PV projects by 2022.



State government hereby approves and mandate utilization of all government/municipal office buildings roofs for implementation of rooftop PV projects. After identification of suitable roofs, concerned departments of state government will be intimated by BREDA seeking their facilitation support for implementation of projects. Roof identification can be done either by BREDA or by private developers themselves but site due diligence and project implementation request will be put by BREDA to concerned government department.

BREDA will also issue model Lease Agreements and Power Purchase Agreements (PPA) that will be signed between project developer and roof owner (concerned government department) and between project developer and DISCOM respectively. In case of net-metering, following the regulations of state government, an agreement will be signed between the project developer/roof owner and DISCOM.

Models mentioned below will be followed for implementation of rooftop PV projects in the state.

- (a) **Solar rooftop on gross metering mode:** The state shall promote eligible consumers to install the rooftop solar system under gross metering arrangement wherein the project shall be located in the consumer premises and shall interconnect and operate safely in parallel with the distribution licensee network. In this category of projects, the government department may provide idle rooftop space of the buildings for installation of solar rooftop PV projects under gross metering or Feed in Tariff (FiT) scheme. The state commission will set up a tariff for rooftop PV projects that can be considered as a buy back price under the PPAs with state DISCOMs. It is recommended that a bi-annual revision in FiT is followed so that buy-back price is true reflection of cost of generation. State DISCOMs can conduct regular competitive bidding processes after identifying the suitable rooftops to discover buy back price and then sign PPAs. Processes such as metering arrangement, energy accounting, settlement, project capacity etc. shall be governed by regulations issued by Bihar Electricity Regulatory Commission (BERC) as well as the guidelines issued by state DISCOMs.
- (b) **Solar rooftop on net metering mode:** The state shall promote eligible consumers to install the rooftop solar system under net metering arrangement wherein the project shall be located in the consumer premises and shall interconnect and operate safely in parallel with the distribution licensee network. The targeted consumers include individual households, industries, commercial establishments, institutions, residential complexes, etc. shall be eligible with project capacity ranging from minimum 1 kWp to 1 MWp with or without battery back-up support, or as per the net-metering regulations which is (Rooftop Solar Grid Interactive systems based on Net-Metering) Regulations, 2015. Processes such as metering arrangement, energy accounting, settlement, project capacity etc. shall be governed by regulations issued by Bihar Electricity Regulatory Commission (BERC) as well as the guidelines issued by state DISCOMs.



- (c) **3rd party sale:** Government of Bihar also encourages developers to set up rooftop solar projects for sale of power to a captive consumer or to a 3rd party. Applicable charges after adjusting incentives mentioned in this policy document will be payable to DISCOMs.

The state shall also encourage state government departments and their respective buildings like Hospitals, health centers, colleges, schools, guesthouses, warehouses, etc. to develop solar rooftop projects in their campus primarily for self-consumption by availing any Viability Gap Funding (VGF) support available from central government.

Additionally, developers are encouraged to undertake rooftop PV projects under central sector schemes managed by Solar Energy Corporation of India (SECI) or any other central agency. BREDA will be the nodal agency to facilitate implementation of such projects and assist private players in liaising with DISCOMs or other players.

7.3. Small Hydro

The state has significant Hydro potential that includes sites for developing Micro (up to 100 kW), Mini (101kW-2 MW) & Small (2.001-25 MW) Hydro power projects. RE policy envisages cumulative target of 220 MW to be achieved from Micro/Mini/Small Hydro projects in Bihar.

The list of hydro power projects for development by Independent Power Producer (IPP) will be notified by BHPC from time to time in its website. However, the Developers will also have the option to identify/ select site at its own. In case of new sites, Pre- feasibility reports/ DPR will be prepared by the developer and same will be submitted to BHPC for its techno-commercial appraisal/ approvals before award of sites. The tariff for energy sale from the project shall be decided either by BERC or through tariff based bidding by Bihar State Hydroelectric Power Corporation Limited (BSHPCL) in case of identified projects >3 MW or on the basis of actual project cost in case of self-identified projects up to 25 MW and identified projects up to 3 MW. The developer can avail the Central Financial Assistance (CFA) from Ministry of New & Renewable Energy (MNRE), which shall be accounted for while determination of tariff by BERC.

The developer company will have to make agreement with Distribution Company for use of its distribution network on mutually agreed terms & conditions or they have to construct suitable sub transmission facility to deliver the power to the nearest (Grid Sub-Station/ Power Sub-Station) GSS/PSS of the distribution company.

The project developer may sell to a third party/utilize generated power at the place of generation or at any other place for the captive use, through network of Bihar State Power Transmission Company Ltd (BSPTCL), North Bihar Power Distribution Company Ltd. (NBPDC) or South Bihar Power Distribution Company Ltd. (SBPDCL) after payment of applicable Open Access charges, surcharges & additional surcharge and any other charges as approved/notified by Bihar Electricity Regulatory commission (BERC).



7.4. Biomass & Bagasse Power

The biomass resource atlas estimates biomass power potential of 757 MW in Bihar, comprising of 641 MW from surplus agricultural residue and 116.5 MW from forests and wastelands. Apart from this, potential for 300MW additional power can be realized through bagasse based cogeneration in the sugar mills of the state. 'Biomass' means wastes produced during agricultural and forestry operations (for example straws and stalks) or produced as a by - product of processing operations of agricultural produce (e.g., husks, shells, deoiled cakes, Bagasse etc); wood produced in dedicated energy plantations or recovered from wild bushes/weeds; and the wood waste produced in some industrial operations. The policy envisages that Biomass and Bagasse based cogeneration projects will contribute a cumulative target of 244 MW by 2022.

In order to ensure long term fuel availability and sustainable price, Government of Bihar shall promote captive plantation backed biomass power plants. For any project having a capacity of 5 MW or more, BREDA/SIPB shall not approve any other biomass based project within a radial distance of 25 km from approved project. However, BREDA/SIPB reserves the right to reduce or increase the above area, while keeping in view the availability of biomass in that area. Among the approved projects, if there is a conflict of area of biomass which may affect the sustainability of these projects, based on the progress made in the projects, suitable measures will be taken by BREDA/SIPB.

Development of energy plantation on Government waste land and degraded forest land may be allowed for creating supply of supplementary fuel for biomass power plants. Should there be issues in getting approval from State Investment Promotion Board (SIPB)/BREDA for Bio-mass based project within a defined proximity to another biomass project, SIPB/BREDA shall be requested to review the norms for captive plantation backed biomass power plants.

Resource assessment plays an instrumental role towards planning for establishment of a biomass based power plant. The Biomass Resource Atlas compiled the data of biomass for years of 1998, 2000 and 2004. However, with the passage of time, the land use pattern and the agricultural pattern has shown a significant change. Owing to unavailability of the correct biomass data with the state agencies, the developers are hesitant in establishing the biomass based projects in states. Hence, it becomes imperative to conduct an independent potential assessment of surplus biomass feedstock as well as feedstock prices across the state. The assessment of feedstock prices shall also be a key input to BEREC while drafting tariff for Biomass based power projects. The database should have provisions of regular up-gradation to make way for refined and additional data and also to accommodate advances in crops and other efficient biomass technologies.

Water linkage is an important factor for biomass projects. Most of the biomass projects in India use wet cooling systems which require huge volume of water. Biomass power plants



that are not in vicinity of the water linkage may have to employ dry cooling system. However dry cooling system will push the capital cost of the project on the higher side and also have high auxiliary consumption, requiring that a separate benchmark tariff be proposed from BERC.

BREDA shall undertake the state wide detailed biomass assessment; however project developers will carry out their own biomass assessment in the region before finalizing the capacity of project and submitting it to BREDA/SIPB.

All the biomass projects have to submit a progress report on the status of project commissioning and based on the progress made BREDA/SIPB may take decision on project continuation or cancellation. This is important as any conflict in terms of area of biomass collection should come under observation of BREDA/SIPB as soon as possible. Dispute resolution will be undertaken by BREDA.

7.5. Mini-grid projects

The Bihar Government has made sustained progress in reaching and providing power to rural areas through various electrification schemes. To meet the ambitious goal of providing reliable 24x7 power to all by FY 2018-19, decentralized solutions like mini grids will play a very crucial role. Bihar is endowed with solar energy and locally available resources like biomass, which can be tapped by mini grids for decentralized power generation and distribution. Besides improving electricity access, mini-grid solutions can help in stimulating local employment opportunities by supporting commercial and productive enterprises, khadi, village industries etc., and helps in enabling social and economic security and development.

The Bihar government aims to build an enabling investment and implementation environment for renewable energy based mini grid deployment in the state. Mini grid projects with capacity size of up to 500 kW, and powered by solar, biomass, wind, or hybrid can be installed. Such projects can be commissioned in unserved (villages or hamlets that do not have grid supply) and under served (grid areas with low power supply) parts of the state. The Bihar government targets to achieve deployment around 100 MW of capacity equivalent of mini-grids.

The mini grid projects will meet the basic needs of every household in the vicinity, and offer energy for applications beyond lighting such as fan, mobile charging, and productive and commercial requirement. Mini grids in the state will be implemented by project developers (preferably service providers) mainly through three implementing partners:

1. BREDA under the existing central government scheme (DDUGJY-DDG) – Tendering model
2. BREDA under the state government scheme - State subsidy model
3. Project developers or energy service companies – Energy Service Company (ESCO) model (without state subsidy)



The projects under the state-subsidy will operate in 'priority areas' as defined or identified by state government (or BREDA), and the state government shall provide a subsidy as per budget outlay for mini grids. In this case, the operators will be allowed to charge a tariff as prescribed by the extant mini grid policy or framework. The ESCO model of implementation, shall allow developers to self-identify projects and charge a mutually agreed tariff from consumers. All the projects implemented under the subsidy model and non-subsidy shall be constructed on a Build, Own, Operate and Maintain (BOOM) basis, and they encouraged to access other Central government subsidies or incentives, if available.

For streamlining project development and operations, and for ensuring project sustainability, the state government will develop certain mechanisms for enabling single window clearance, right-of-way, extending eligibility for infrastructure related support and incentives as per the industrial policy etc., and for securing the project investments through suitable exit options in case the grid arrives. The developer will principally be offered three options for exit:

- (a) continue to operate standalone i.e. parallel to the grid
- (b) Sell excess or all power to DISCOM at tariff determined by the Regulator every year, and
- (c) Transfer the project to the DISCOM. The DISCOM should explore the opportunity of working in a franchisee mode with the developers.

The Bihar Electricity Regulatory Commission (BERC) will support the state government (or BREDA) in all matters that require regulatory directions such as on exit options, determining tariff, power purchase and franchisee norms, grid connectivity etc. In this regard, BERC should develop a mini grid regulatory framework. BERC in association with state DISCOMs/BREDA will formulate a regulatory framework and issue same within 3 months of issuing of this policy. This framework will form part of an agreement between private developers and BREDA under projects with subsidy from state government. For the without subsidy model/projects, the framework agreement will be signed at the grid reach event.

The framework will clearly define the asset ownership (covering both power plant and public distribution network), payment made by DISCOM to private developer for acquisition of distribution network or for complete acquisition of mini-grid assets, tariff payable to private developer by DISCOM for grid feed should the power plant asset is continued to be owned by private developers.

7.6. Other initiatives

7.6.1. Solar parks: The solar park is a concentrated zone of development of solar power generation projects and provides developers an area that is well characterized, with proper infrastructure and access to amenities and where the risk of the projects can be minimized.



The solar park will provide a huge impetus to solar energy generation by acting as a flagship demonstration facility to encourage project developers and investors, prompting additional projects of similar nature, triggering economies of scale for cost-reductions, technical improvements and achieving large scale reductions in GHG emissions.

Large size projects have a potential to bring down the cost of solar power. The state government shall make due efforts to facilitate the development of solar parks in the state. The parks shall be sized in a manner that yields economic parity to the project developers and competitive tariff to the procurer. Incentives available under MNRE's solar park scheme shall be applicable under this category to the solar parks.

Solar parks are envisaged to be developed in the following modes:

- **Mode A:** The solar park developed by BREDA/nodal agency with support from MNRE /SECI and private players shall be provided with 'plug and play' participation mode. Under this policy, The State Government will identify the land, facilitate in building up of the necessary infrastructure like power evacuation, drainage and water requirements, internal roads, training center, etc. Funds for multilateral/bilateral development agencies may be used for development of power evacuation infrastructure, as well as within park infrastructure. Equity contribution from the state government may also be considered, irrespective of the government/private land on cost sharing basis between private developers and the State Government.
- **Mode B:** The solar park developed under Joint Venture mode in which BREDA/nodal agency/state government will have a minority stake (at least 26%), while private developer would contribute the remaining share. In this case, land will be identified by private developers, and BREDA/nodal agency will facilitate all necessary approval and clearances for utilization of land bank for solar park. The development will be undertaken as per the JV agreement and private developers will be allowed to earn return for services provided under the solar park. BREDA will issue detailed guidelines for solar park within 06 months of issuance of this policy.
- **Mode C:** The Solar Park shall be developed entirely on government funds on the designated government land. The government may form Special Purpose Vehicle (SPV) for this purpose or appoint the responsibility to any agency or its department, as deems fit.

7.6.2. Canal top/Canal bank solar: Bihar has many large canals that offer a potential avenue for development of PV projects and save on water loss due to evaporation in addition to generation of solar energy and creating employment opportunities for local population. The state government shall support installation of such grid connected canal top/canal bank projects. BREDA will play a key role in implementation of such projects through consulting state irrigation departments, entering into requisite agreements, release capital subsidy or financial assistance available from MNRE to developers.



- 7.6.3. Solar biomass storage hybrid:** In its pursuit of low carbon growth, government of Bihar would be focusing on technologies that have been successfully demonstrated outside India. One of the important areas of commercialization and deployment include solar projects, hybridized with biomass or energy management and storage systems to take care of fluctuations in the variable generation.

Seasonal variation in the availability of biomass is one of the barriers faced by biomass power generation projects. Biomass hybrid model may provide the solution to overcome these barriers as two renewable energy resources complement each other with regard to availability, thereby enhancing the chance of improved PLF and so viability. Battery storage may also be explored to demonstrate storage technologies to offset sudden drop in power injection from solar project.

- 7.6.4. Floating solar PV:** Floating solar projects have emerged as a viable alternative at places where land is in scarcity. Government of Bihar shall support floating grid connected solar projects to be deployed by 2022. By installing solar panels over a pond, lake or reservoir, the panels are naturally cooled, resulting in improved power production performance compared to similar ground mounted projects. The cooler environment also reduces stress on the system, extending the system's lifespan. In addition to power generation, the system shall also significantly reduce algae growth and evaporation in the retention pond.

7.7. Decentralized applications

To comply with the minimum targets, Government of Bihar shall identify priority areas/sectors for deployment of decentralized applications including solar street lights, street lighting system, solar water heaters, solar concentrators, solar irrigation pumps, micro wind etc. and take necessary action, in time bound manner, to implement the solar systems in those priority areas/sectors.

Scarcity of electricity coupled with the increasing unreliability of monsoon rains and prevalent costly diesel pumping systems pose an economic risk to small and marginal farmers. Solar water pumping systems constitute a cost effective alternative to irrigation pump sets that run on grid electricity or diesel. MNRE has initiated a program for deployment of solar pumps for irrigation and drinking purposes, by channelizing this financial assistance to the end users. Government of Bihar has also actively supported the initiative with an additional subsidy for solar pumps for irrigation. The government now targets deployment of 10,000 solar powered pumps by 2022.

Bihar, being a fast growing economy, will experience a fairly rapid expansion in energy consumption. Concentrated Solar Technologies (CSTs) track the sun's incoming radiation with mirror fields, which concentrate the energy towards absorbers, which then transfer it thermally to the working medium. CSTs can produce a range of temperatures, between 50°C and up to over 400°C, which can be used in a variety of industrial and commercial heat applications, cooking, as well as cooling applications. The government targets deployment of 5000 m² solar concentrator area of CSTs by 2022.



8. Incentives

To enable renewable energy capacity addition in the State, the following incentives shall be provided for eligible developers for those projects setting-up during the operative period. These incentives are already implemented in some of the states which are also mentioned along with incentives.

RE Incentives:

- (a) Transmission & Distribution charges shall be exempted for wheeling of power generated from Renewable Power Projects for only captive use/third party sale within the State.
- (b) Transmission & Distribution losses shall be exempted for Power Projects injecting at 33 kV or below irrespective of voltage-level of the delivery point within the Distribution Company.
- (c) The capital cost of the transmission system for evacuation of Renewable Energy Power to the nearest sub-station including all metering and protective instruments shall be borne by the State Government, provided the power plant is located upto 10km from the nearest sub-station.
- (d) Banking of 100% energy shall be permitted for all Captive and Open Access/ Scheduled Consumers during each financial year. Banking charges shall be adjusted @ 2% of the energy delivered at the point of drawing. It shall be guided by the orders issued by the state commission (BERC).
- (e) Cross subsidy surcharge shall be exempted for third party sale for projects setup within the State for the entire policy period of this RE policy.
- (f) Generation, transmission and distribution of electricity from renewable energy projects shall be treated as an eligible industry under the schemes administered by the Industries Department. The incentives available to industrial units under such schemes shall be available to the RE power producers.
- (g) All Eligible beneficiaries can avail Central Financial Assistance from MNRE or any other central government body, as per the applicable scheme.

Incentives under Industrial Policy:

The Bihar Industrial Investment Promotion Policy, 2016 has recognized such as solar power, biomass, hydel power and other RE Energy Projects as a priority sector under Renewable Energy Sector and offers a number of incentives to solar power generation plants which includes:



Type of Incentive	Salient Features
1. Reimbursement Stamp Duty/Registration	<ul style="list-style-type: none"> (a) No stamp duty to be paid in respect of land allotted by the government to IDA/BIADA. (b) 100% reimbursement of stamp duty/registration fees levied on lease/ sale /transfer of industrial land/shed as also those outside the jurisdiction of Bihar Industrial Area Development Authority would be available to all the new units after the unit commences the commercial production. This reimbursement of stamp duty and registration fees will be granted only for the first time and will not be applicable in subsequent stages of lease/sale/transfer. This incentive will be available to new units only. (c) The area of land required by the unit shall be fully described in the DPR and the Bank Appraisal Report prepared by the bank or financial institution which is supposed to extend the term loan to the unit.
2. Land Conversion Fees	<ul style="list-style-type: none"> (a) 100% reimbursement of "land conversion fees"/ "change in land use" fees being levied for conversion of agricultural land after the unit commences the commercial production.
3. Interest Subvention	<ul style="list-style-type: none"> (a) State shall extend "Interest Subvention" to all the eligible units on the term loan availed by the unit from a scheduled nationalized bank or financial institution approved by RBI/SEBI. (b) Rate of interest for interest subvention will be 10% or actual rate of interest on term loan, whichever is lower. For micro and small units, there shall an interest subvention of 12%. (c) The overall limit of this subvention for priority sector units will be 30% of the approved project cost. The subvention limit for non-priority sector units shall be 15% of the approved project cost. The upper limit of this subvention shall be Rs.10 crore. (d) Disbursement of the subvention amount would be in instalments linked with the term loan repayment schedule stipulated by the concerned bank/financial institutions which extends the term loan to the unit. Interest shall not be paid on promoter's contribution in any form in the unit. (e) In case the promoters do not avail any term loan for the unit, they would not be eligible for this incentive.



Type of Incentive	Salient Features
4. Tax related incentive	<p>(a) All new units can avail tax related benefits with a maximum limit as defined below:</p> <ul style="list-style-type: none"> i. Non-priority sector: 70% of the approved project cost ii. Priority sector: 100% of the approved project cost <p>(b) All new micro and small units will be given tax benefits by additional 30% of the approved project cost.</p> <p>(c) All units engaged in generation of solar and/ or renewable energy for commercial purpose will be given tax benefits by additional 30% of the approved project cost.</p> <p>(d) Government of India is in the process of introducing a uniform Goods & Services Tax (GST) regime throughout the country. In case GST becomes effective, the tax related benefits will be suitably modified.</p> <p>(e) All new units shall be eligible for 100% reimbursement of the electricity duty on power including captive power consumed by the same unit or exported to the BSPHCL from the date of commencement of commercial production for a period of 5 years subject to the overall limit defined above. Electricity duty exemption will not be available on captive power exported to entities other than BSPHCL.</p>

In case of any inconsistency between the Bihar Industrial Investment Promotion Policy, 2016 and Policy for promotion of New & Renewable Energy Sources 2016, the provisions under this Renewable Energy Policy shall prevail.

9. Mandatory use of Renewable Energy sources

The Government of Bihar shall issue amendments to the Building Rules, making the use of solar water heating systems mandatory for all designated new Houses/buildings/Marriage halls/hotels/hostels etc. with an area of more than 350 m²

Installation of Solar water heating systems shall be made mandatory for industries having hot water boiler/ steam boiler using fossil fuel.

Large Industries having 1000 kVA and above as connected load, shall be mandated to install solar PV project to offset some of their electricity demand.



10. Land

It is the responsibility of the project developer to acquire the required land for setting up the project. However, in case of land owned by Revenue Department, the land allotment shall be done as per the prevailing government policy.

BREDA shall also create a 'Land information bank' for each district which shall be made accessible online through BREDA website. Land owners, including farmers may come forward and provide the details of their land to the Land officer. The District Land officer shall gather details of land suitable for deployment of RE projects in the respective district, which shall be collated by BREDA at the state level. BREDA will thus act just as facilitator to provide information on land, which can directly be acquired by any investor from the land owner.

All the state government ministries and their respective departments shall be requested to carry out rooftop survey and provide a list of number of rooftops and their shade free areas. The rooftop database thus developed shall also be maintained on the 'Land Information Bank' and shall be available for prospective project developers. As a mandate, all government rooftops shall be utilized for setting up of grid connected solar rooftop project. The project will be executed through BREDA or any designated nodal agency nominated by the Energy Department.

The project developers can directly purchase private land for setting up projects and use of agriculture land will also be allowed as per provisions of State Industrial Policy.

11. Pollution Clearance

As per the notification from Ministry of Environment, Forest and Climate Change, following pointers must be noted:

- Power plants upto 15 MW, based on biomass and using auxiliary fuels such as coal/lignite/petroleum products up to 15% are exempted
- Power plants up to 15 MW, based on non-hazardous waste municipal and using auxiliary fuels such as coal/ lignite/ petroleum products up to 15% are exempted.
- Power plants using waste heat boiler without any auxiliary are exempted.
- Bihar State Pollution Control Board shall also issue clearances within 30 days from the date of application.
- All rules & notification from Ministry of Environment, Forest and Climate Change regarding renewable energy shall be applicable.

12. Building Manufacturing Capacity

The state government gives due focus on creating adequate ecosystem for promoting RE based manufacturing facilities. For solar, the focus shall not be confined to solar PV value chain starting from polysilicon to solar modules; but shall also be on Balance of System as well as assembling of equipment for applications like mini grids, solar street lights, solar



irrigation pumps, etc. This will be done in collaboration with other departments by enabling provisions for establishing special economic zones in the states. The state government will take following actions in this regard;

- (a) Solar parks to support manufacturing: Wherever land availability will be there in planned solar parks, the central government will facilitate establishment of manufacturing facilities as well. Preference will also be given for establishing Renewable energy based manufacturing industries in the existing and upcoming SEZs or Industrial Parks. The benefits of SEZs provided by central government will be available to these manufacturing set-ups including – zero import duty on capital equipment, raw material and excise duty exemption.
- (b) Manufacturing units shall also be offered Exemption from electricity duty for a period of five (05) years.

13. R&D Activities

The state government shall work closely with National Institute of Solar Energy (NISE), National Institute of Wind Energy (NIWE), Alternate Hydro Energy Centre (IIT Roorkee) and reputed universities in India, including but not limited to IITs, NITs, IIMs, IISc, etc. for identification and implementation of R&D projects. The focus of R&D will be to ensure that a functional ecosystem is developed for making Bihar a hub for R&D on RE. The R&D strategy would comprise dealing with focus categories - (i) Basic research having long term perspective for the development of innovative and new materials, processes and applications, (ii) Applied research aimed at improvement of the existing processes, materials and the technology for enhanced performance, durability and cost competitiveness of the systems/ devices in Bihar (iii) Technology validation and demonstration projects aimed at field evaluation of different configurations including hybrids and (iv) support for incubation and start-ups.

The state government shall set up solar R&D, testing and standardization facility in two institutes/universities in Bihar like IIT Patna, NIT Patna, Nalanda University, etc. to promote awareness, R&D amongst researchers and to assist private sector in solving key issues to reliability, adaptability of technology for Indian conditions and conditions in Bihar.

One key output of R&D shall be to ensure setting up of proper recycling protocols and 2 commercial recycling facilities in the state to ensure RE producers dispose of the batteries used in decentralized generation as per guidelines, without causing harm to the ecosystem. The labs shall also explore best options for recycling of waste generated from solar modules, inverters, wind turbines, batteries.

14. Data monitoring

Availability of data plays a key role for project developers and system installers while making investment decisions. Government of Bihar shall set up new precedents in data transparency and shall endeavor to have the performance data of projects in public domain



through its web portal and through mobile application. All new projects to be set up in Bihar shall be mandated to record and provide real time data pertaining to plant performance, which shall be collated and presented on the web portal. Once implemented for grid connected projects, the data monitoring plan shall be extended to off-grid and decentralized projects as well. The data such collected shall help in identifying the key factors affecting the plant performance and then work on ways to improve operational efficiencies of projects.

The state government shall also set up 10 weather stations with support from NIWE at locations suitable for setting up of solar projects, including the proposed solar parks. Solar resource data is required by the project developers to assess the likely generation from project, hence the financial returns. Solar data monitored using satellite imaging is reliable but actual ground level data shall provide the project developers a better tool for making financial investment decision. This will provide the project developers with the information that is bankable and will reduce the possibility of project failure at the stage of financial closure.

15. Transmission Infrastructure and Grid Balancing mechanism

Large sized RE capacity additions are expected from the remotely located pockets of solar potential areas and this power is required to be transmitted to the load centers in other States/Regions. Therefore, large scale solar projects will be permitted to get directly connected at the Central Transmission Utility Network. CERC has also amended the Grid Connectivity Regulation allowing cluster of Renewable Energy generators of aggregate capacity 50 MW or more to get direct connectivity to Central Transmission Utility (CTU) network. However, advance planning of inter-state transmission network is crucial for ensuring connectivity to such solar projects.

The capital cost of the transmission system for evacuation of Renewable Energy Power to the nearest substation including all metering and protective instruments shall be borne by the State Government, provided the power plant is located upto 10km from the nearest substation. The onus of constructing the transmission system shall lie on the developer themselves whereas necessary assistance/help for getting Right of Way (ROW) etc. will be provided by the State Government. This cost shall be reimbursed by Bihar Renewable Energy Development Fund. In case of any shortfall, the same shall be reimbursed by the state government, provided the developer offers to supply at least 50% generation, subject to a minimum of 5 MW of installed capacity, otherwise this entire cost shall be borne by the developer.

The intermittent nature of solar and its effect on grid disturbance can be controlled by using balancing mechanism at generation side. The quick start plants like open cycle gas based power plants and pumped storage hydro are best suited for stabilizing the grid disturbances and therefore, such plants will be promoted for inter-connection. All such solar plants which are being connected to the central grid must comply with the scheduling stipulations of IEGC, 2010.



The project developer will be allowed to draw energy for their consumption during maintenance/shut down period of the project, where BSPHCL/ Distribution Licensee is procuring power from that generating station, at the rate/tariff as approved by BERC for such New and Renewable Energy Project. However, if BSPHCL/Distribution Licensee is not procuring power from that particular generating station, the drawl of energy for their consumption during shut down/maintenance period shall be at the applicable rate/tariff as approved by BERC for purchase of power from such New and Renewable Energy project, whichever is higher.

16. Forecasting & Scheduling

The Renewable Energy shall, for the time being, be exempted under scheduling procedure for Intra State Availability Based Tariff (ABT). The project developer shall however abide by instruction of State Load Dispatch Centre. The actual energy injected in the grid during particular time block of 15 minutes shall be post-facto considered available for drawl schedule for sale of power to Discom/ Third Party or for giving set-off against the consumption of recipient unit in case of wheeling. As and when forecasting and scheduling mechanism is made applicable to Renewable Energy Projects, these Power projects shall abide by such rules and regulations.

17. Skill Development and Capacity Building

It has been realized that a large number of solar energy professionals will be required not only in Bihar, but in the entire country to achieve ambitious target of 100 GW of solar capacity. The government of Bihar, through BREDA shall design training programs in association with NISE to train electricians, mechanical & civil experts on solar. Various skill development programs will be designed by BREDA and NISE and subsequently training will be imparted across the state. Skills will be developed across segments including – installation, operation and maintenance of solar projects, testing of solar products, solar resource assessment, refurbishment, DPR preparations etc. BREDA will provide certifications under these development programs.

BREDA shall also coordinate with regional ITIs to include solar in the curriculum. Support shall also be provided to local entrepreneurs in setting up commercial shops for solar rooftop and decentralized applications. BREDA shall also explore programs like Bihar Rural Livelihoods Project - "JEEViKA", to reach out to local youth especially women and support entrepreneurship at the grass-root level, to improve socio-economic conditions of financially underprivileged.

18. Single Window Clearance

The nodal agency/BREDA shall Facilitate in obtaining revenue land – wherever available and required and shall facilitate in getting power evacuation and/ or Open Access as per the regulation issued by BERC and amended from time to time. The nodal agency shall also



facilitate and process of proposals for availing subsidy as per MNRE guideline and shall also co-ordinate with MNRE/SECI/NTPC and any other Central/State agencies in obtaining necessary clearances, approvals, grants and subsidies.

19. Bihar Renewable Energy Development Fund

Power producers willing to set up grid connected Renewable Energy projects should submit their application in the prescribed format along with a registration fee of Rs. 100 per kWp, subject to minimum Rs. 2000 per project and maximum upto Rs. 10,000 per project. Projects with an individual capacity of more than 1 MW shall also contribute a one-time payment as facilitation fee of Rs. 100,000/MW, payable at the time of application towards creation of Bihar state Renewable Energy Development Fund. Additionally, with approval from BERC, a renewable energy development cess of 10 paise/unit will be charged for each unit of power sold by state DISCOMs for all consumer except BPL & agriculture consumer and deposited against the fund. A service charge of 7% shall be charged by BRENDA for execution of RE projects which will contribute towards the Bihar renewable energy development fund. In addition to the above the incentive/penalty imposed as proposed in the Energy Conservation Building Code (ECBC) will also be a part of the Bihar renewable energy development fund.

A detailed capacity building plan of BRENDA, made within 3 months of issuance of this policy, will be funded through this fund. Various activities of BRENDA's capacity building will include setting up of – single window clearance cell for different technologies/applications, regulatory cell to liaison with BERC and file petitions, projects monitoring cell, rooftops due diligence cell etc.

The Bihar Renewable Energy Development fund shall be utilized for following activities in the order of priority:

1. Institutional development of BRENDA including BRENDA Project Management Unit (PMU) Charges, capacity building and infrastructure.
2. Skill development, Research & Development initiatives, setting up of weather stations, biomass/solar resource assessment, etc.
3. Reimbursement to State Government against the capital cost of the transmission system for evacuation of RE power to the nearest sub-station
4. Contributing towards budget for implementation of capital subsidy based decentralized applications including mini-grids, solar irrigation pumps, improved cook stoves etc.
5. Providing incentive as per Energy Conservation Building Code.

The Managing Committee of BRENDA chaired by Principal Secretary (Energy) shall meet quarterly to discuss the utilization of fund as well as initiatives to be supported by the fund.



20. Power to remove difficulties

If any difficulty arises in giving effect to this policy, the Managing Committee chaired by Principal Secretary, Energy shall be authorized to issue clarification as well as interpretation to provisions, as may appear to be necessary for removing the difficulty either on its own motion or after hearing those parties who have represented for change in any provision. Non addressed grievance can be challenged in court of law.

21. Monitoring committee

All the renewable projects (except small hydro projects) shall be required to adhere to following schedule of project development. Any delay in meeting these deadlines may lead to cancellation of projects at discretion of project monitoring committee.

- Financial closure and order for procurement: 6 months
- Receiving of plant and machinery: 12 months
- Commissioning of project and commercial operation: 18 months

* Zero date shall be the date of notification of this policy or the date of SIPB approval, whichever is later.

All New and Renewable Energy projects approved by BREDA/SIPB, shall be required to submit to BREDA/BSHPC, the half yearly reports incorporating the copies of the permits/clearances/consents received from various departments/authorities, as applicable and documentary evidence for the achievement of the activity milestones mentioned above. The half yearly report shall also include details and explanations on the changes in plant capacity, process or any other relevant information which may affect the date of commissioning for project.

The managing committee chaired by Principal Secretary, Energy will monitor the implementation of the policy as well as projects under implementation or to be implemented under the policy.

The committee shall meet quarterly to monitor the implementation of the policy. If any difficulty arises in giving effect to this policy, the Managing Committee is authorized to issue clarification, amendments or provisions required for successful implementation of the policy.

22. Implementation guidelines/framework

BREDA will issue an implementation guidelines or framework for all technologies/applications covered in this policy within a stipulated period of issuance of this policy, as mentioned below. The framework will clearly identify the mechanisms, agencies and their roles, timelines etc.



Sr. No.	Guidelines	Release duration (After RE Policy issuance)	Responsible Agency
1.	Mini-grid implementation guidelines	3 months	BREDA in consultation with DISCOMs and BERC
2.	Rooftop solar PV Potential assessment in Bihar	12 months	BREDA
3.	Biomass Power Potential assessment in Bihar	12 months	BREDA
4.	Land information bank including canal top area	12 months	BREDA in consultation with irrigation department, building construction department, Urban & Rural Development Department and any other concerned department.
5.	Solar power implementation guidelines including solar park guidelines	6 months	BREDA in consultation with DISCOMs and BERC
6.	Small hydro implementation guidelines	3 months	BHPCL
7.	Revised net metering guidelines	6 months	DISCOMs in consultation with BREDA and BERC
8.	Gross metering guidelines	6 months	DISCOMs in consultation with BREDA and BERC
9.	Fund management guidelines	6 months	BREDA
10.	Data transparency guidelines	6 months	BREDA
11.	Change in municipality by-laws and building code	12 months	Department of Urban development/Municipal corporations in consultation with BREDA



Memo No. 1917

Patna, Dated 08/06/2017

Copy Forwarded with CD and tow ha ropy to Deputy Secretary E-Gazette cell, Bihar, Patna with request to publish the resolution in the next issue of the extraordinary Gazette of Bihar and send 500 (Five hundred) copies of the same to this department.



Joint Secretary, Govt. of Bihar

Memo No.1917

Patna, Dated 05/06/2017

Copy Forwarded to the Chief Secretary, Bihar/Principal Secretary to the Governor, Bihar/Principal Secretary to the Chief Minister, Bihar/ All Principal Secretary, Govt. of Bihar/ Chairman/Member/Secretary, Bihar Electricity Regulatory Commission, Patna/Chairman Cum Managing Director, Bihar Sate Power (Holding Company Ltd. Patna)/ Managing Director, Bihar Hydo-electric Power Corporation, Patna/ Director, Bihar Renewable Energy Development Agency, Patna/ Chief Electrical Inspector, Electrical Inspectorate, Bihar, Patna/ Secretary, Ministry of power, Govt. of India, Sharam Shakti Bhawan, Raffi Marg, New Delhi/ Secretary, Ministry of New & Renewable Energy source, Govt. of India, Block No. 14, CGO Complex, Lodi Road, New Delhi/ Member of Niti Ayoj Commission, Planning Bhawan, New Delhi/ Secretary Central Electrical Authority, R.K. Puram, New Delhi for information and necessary action.



Joint Secretary, Govt. of Bihar





Energy Department, Government of Bihar