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Renewable energy in India

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Market framework

Government electricity participants

Who are the principal government participants in the electricity sector? What roles do they perform in relation to renewable energy?

The Constitution of India specifies the distribution of executive and legislative powers between the Union and States. 'Electricity' is listed in the concurrent list under the Constitution of India and the Central/Union Parliament and state legislatures have concurrent powers to enact laws on this subject. Therefore, both the Union and state legislatures can enact laws on 'electricity'. However, the laws enacted by the Union Parliament will override the laws enacted by state legislature in the event of inconsistency or conflict. The Electricity Act 2003 (Electricity Act) enacted by the Union Parliament provides the framework for generation, transmission, distribution, trading and use of electricity in India.

The Electricity Act, among other things, provides for the establishment of regulatory commissions at the central level and state level to administer generation, distribution and transmission of electricity. See question 11.

The Central Electricity Authority (CEA) is a statutory organisation that stipulates, inter alia:

- the technical standards for construction of electrical plants, electric lines and connectivity to the grid;
- safety requirements for construction, operation and maintenance of electrical plants and electric lines; and
- grid standards for operation and maintenance of transmission lines.

The Ministry of Power (MOP) is the administrative ministry of the Government of India (GOI) primarily responsible for development of electrical energy in the country. The MOP is responsible for formulation of policies of the GOI, administration of the Electricity Act and planning in relation to thermal and hydropower generation, transmission and distribution of electricity. The Ministry of New and Renewable Energy (MNRE) is the nodal agency of the GOI for promotion of renewable energy, both grid-connected and off-grid. As per the GOI (Allocation of Business) Rules 1961, the MNRE is entrusted with development and matters related to solar energy, bio-gas units, small hydel power, tidal energy, geothermal energy, etc. At the state level, the MNRE's schemes are implemented in coordination with nodal agencies or departments for renewable energy. The MNRE has designated different institutes or agencies to implement the schemes such as Solar Energy Corporation of India Limited (SECI) and NTPC Limited.

SECI is a GOI enterprise which facilitates the implementation of renewable energy projects including the National Solar Mission (NSM). It is responsible for implementation of certain MNRE schemes, the major ones being the viability gap funding (VGF) schemes for large-scale grid-connected projects, solar park scheme, grid-connected solar rooftop scheme, along with several other specialised schemes such as the defence scheme and canal-top scheme.

The Indian Renewable Energy Development Agency (IREDA) is a non-banking financial institution under the administrative control of the MNRE, which provides financial assistance for renewable energy and energy-efficiency projects.

The National Institute of Solar Energy, National Institute of Wind Energy (NIWE) and National Institute of Bio-Energy are autonomous institutions of the MNRE and act as the top national R&D institutions in the field of solar, wind and bio-energy, respectively. The NIWE has also been notified as the nodal agency for development of offshore wind energy in India.

Private electricity participants

Who are the principal private participants in the electricity sector? What roles do they serve in relation to renewable energy?

The Electricity Act, the National Electricity Policy 2005 and the Tariff Policy 2016 (Tariff Policy) encourage private sector participation in renewable energy through measures such as fixing renewable purchase obligations (RPOs) for certain entities that are mandated to comply with RPOs.

Private sector entities are present in the entire value chain of the electricity sector including generation, transmission and distribution of electricity. Private sector entities including foreign investors have set up renewable energy projects and supply electricity to distribution utilities, private consumers or for captive consumption. They account for 94.91 per cent of the installed capacity of the grid interactive power in renewable energy (as of 31 May 2019).

Definition of 'renewable energy'

Is there any legal definition of what constitutes 'renewable energy' or 'clean power' (or their equivalents) in your jurisdiction?

While the Electricity Act does not provide a definition of renewable energy, there are other legislation and policies at both central and state level providing the definition of renewable energy sources. Among these, the Central Electricity Regulatory Commission (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations 2017 define 'renewable energy' as grid quality electricity generated from renewable energy sources. The term 'renewable energy sources' has been further defined to mean small hydro, wind, solar including its integration with combined cycle, biomass, biofuel cogeneration, urban or municipal waste and other such sources as may be approved by the MNRE. Also, by way of office memorandum dated 8 March 2019, the MOP has now also classified hydro power project stations with a capacity of more than 25MW as a renewable energy source.

Framework

What is the legal and regulatory framework applicable to developing, financing, operating and selling power and 'environmental attributes' from renewable energy projects?

Pursuant to the Electricity Act, certain state electricity regulatory commissions (SERCs) have issued regulations in connection with RPOs. The SERCs stipulate certain percentages for procurement of energy generated from renewable energy sources on the basis of total consumption of electricity within the demarcated areas for supply by the distribution utilities. These regulations apply to entities that are mandated to comply with RPOs and include consumers owning captive power plants and open access users. RPOs are divided into solar and non-solar. Recently, the MOP notified the long-term growth trajectory of RPOs for 2019-20 to 2021-22 (for 2020-21, the RPOs notified for solar is 8.75 per cent and non-solar is 10.25 per cent). The RPOs can also be discharged by purchase of environment attributes sold as intangible energy commodities called renewable energy certificates (REC). As per the memorandum dated 8 March 2019, the MOP also notified hydropower purchase obligation (HPO) as a separate obligation within the non-solar renewable purchase obligation. The HPO will be within the existing non-solar RPO however the percentage of the non-solar RPO will be increased so that the existing non-solar RPO for other renewable sources remain unaffected. To operationalise HPO, the MOP is yet to notify the annual HPO targets and introduce amendments in this regard.

Under the REC framework, a developer sells the electricity generated and the environmental attributes associated with clean energy separately. The entities obligated under the RPO regime from any part of India may purchase these RECs to meet their RPO targets. The RECs are issued by the National Load Dispatch Centre on application by the generator equivalent to the amount of electricity injected into the grid as certified by the State Load Despatch Centre, and each REC represents 1MWh of energy injected into the grid from renewable energy sources. In order to ensure compliance by entities obligated under the RPO regime to purchase RECs, MNRE has created the RPO compliance cell, which will coordinate with concerned states, the Central Electricity Regulatory Commission (CERC) and SERCs on matters relating to compliance, including periodic reporting. Further, in the event of default, such mechanism will ensure appropriate actions being taken against defaulting entities promptly.

Stripping attributes

Can environmental attributes be stripped and sold separately?

RECs can be sold on a market discovered price within a price band fixed by the CERC, from time to time. There are two types of separately priced and traded RECs (solar RECs and non-solar RECs). The RECs are tradable only on power exchanges (Power Exchange India Limited and Indian Energy Exchange) and can be transferred from the renewable energy generators to the purchasing entities, but cannot be further traded by the purchasing entities.

Government incentives

Does the government offer incentives to promote the development of renewable energy projects? In addition, has the government established policies that also promote renewable energy?

At central or federal level, the Tariff Policy and the National Electricity Policy 2005 broadly encourage energy from renewable sources. The MNRE launched NSM, the National Offshore Wind Energy Policy, and the Policy for Repowering of the Wind Power Projects as energy source specific policies.

According to the CERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations 2017, all renewable energy power plants except biomass power plants with installed capacity of 10MW and above and non-fossil fuel-based cogeneration plants shall be given a 'must run' status and not be subject to 'merit order despatch' principles.

Pursuant to the Tariff Policy, the CERC has exempted payment of inter-state transmission charges and losses for solar and wind energy generators for 25 years from commissioning for projects set up through competitive bidding, based on compliance with certain terms and conditions. Further, in view of shorter gestation period of renewable energy projects, the GOI has issued directions to the CERC to accord early regulatory approval for the transmission system associated with renewable energy projects amounting to 66.5GW.

The National Offshore Wind Policy 2015 empowers the GOI to bundle power generated from offshore wind power projects with conventional power to reduce the cost of power generated. In August 2016, the MNRE released the Policy for Repowering of Wind Power Projects under which turbines with a capacity of 1MW and below are eligible for repowering. Pursuant to the policy, IREDA provides an interest rate rebate of 0.25 per cent for repowering projects in addition to all fiscal and financial benefits available to new wind projects.

The GOI has provided various tax and fiscal incentives to electricity generated from specific energy sources such as accelerated depreciation, etc. There are incentives available to renewable power projects at state level as well. Many of these states have specific policies for the source of energy (such as separate policies on wind and solar), which have high potential in a particular state. Through these policies, the state governments grant various fiscal incentives such as exemption of electricity duty, exemption from cross-subsidy surcharge, exemption from payment of stamp duties and land registration charges and exemption from transmission and distribution charges for wheeling of power. Certain states also provide procedural relaxations such as deemed non-agricultural status of the approved project land. In certain states, open access is given on priority basis or deemed to be given if the application for open access for renewable power projects is not granted within the time frame specified under the regulations. However, in view of the increased generation from renewable sources and the enhancement of technology, there seems to be a reversal in the trend, as it is now being argued that renewable projects can have parity with conventional sources of energy. For instance, in Tamil Nadu and Karnataka, transmission charges, cross-subsidy charges and other charges have been made applicable for new solar and wind energy projects.

The MNRE has issued various schemes and policies in 2018-19 such as, in August 2018, a project titled 'Scale up of Access to Clean Energy for Rural Productive Area' to provide clean energy for rural livelihoods and the reduction of greenhouse gas emissions in areas of Assam, Madhya Pradesh and Odisha. In February 2019, the MNRE issued Payment Security Mechanism Guidelines for VGF Schemes under NSM that stipulate the creation of a payment security mechanism fund of 5 billion rupees to cover delays in payments by the buying entities.

In June 2019, the GOI approved the proposal to make it mandatory for distribution licensees to open and maintain adequate letter of credit as payment security mechanism under power purchase agreements. Further, in relation to specific disputes of time extension, the MNRE, in June 2019, issued an order regarding the setting up of dispute resolution committee to resolve disputes related to:

- appeal against decisions given by SECI/NTPC on extension of time requests based on the contracts executed; and
- requests for extension of time not covered under such contracts.

Are renewable energy policies and incentives generally established at the national level, or are they established by states or other political subdivisions?

Renewable energy policies and incentives are established both at the national level and at the state level. See question 6.

Purchasing mechanisms

What mechanisms are available to facilitate the purchase of renewable power by private companies?

See question 4. To promote renewable energy sources, the Tariff Policy envisages a renewable generation obligation. Pursuant to this, a developer proposing to establish a coal or lignite-based thermal generating station would be required to establish such renewable energy generating capacity or procure and supply renewable energy equivalent to such capacity, as may be prescribed by the GOI. This has also been proposed in the Electricity Amendment Bill 2018. The renewable energy produced by such generator will be bundled with its thermal generation for the purposes of sale. In the event that an entity that is mandated to comply with RPO procures this renewable power, then such entity would be considered to have met the RPO. If an existing coal and lignite-based thermal power generating station sets up renewable energy generating capacity, the power from such plant may be bundled and the tariff of the renewable energy shall be allowed to pass through by the CERC and SERCs. Buying of such power shall count towards the RPO of such entities.

Further, to ensure connectivity to renewable energy sources, CERC approved the detailed procedure made under the CERC (Grant of Connectivity, Long-Term Access and Medium-Term Open Access in Inter-State Transmission and related matters) Regulations 2009 for grant of connectivity to projects based on renewable energy sources to inter-state transmission systems. This is applicable to generation projects based on renewable energy sources, including hybrid projects based on renewables and storage, solar power park developers, wind power park developers, wind-solar hybrid power park developers and power park developers based on hybrids of renewable source and storage.

Legislative proposals

Describe any notable pending or anticipated legislative proposals regarding renewable energy in your jurisdiction.

The Electricity (Amendment) Bill 2018 provides definitions of 'renewable energy' and 'renewable energy service company' that are not provided for in the Electricity Act. To promote the generation of electricity from renewable energy sources, the Electricity Amendment Bill requires coal (including lignite) thermal generating stations to set up a renewable energy station or procure energy from renewable energy sources, provides for imposition of penalty in case of non-compliance with the renewable purchase obligation, and envisages preparing of National Renewable Energy Policy. Also, the Union Budget for 2019-20 seeks to ensure power availability and connectivity through 'One Nation, One Grid' and removing barriers of cross-subsidy surcharges, undesirable duties on open access sales or captive generation for industrial and other bulk consumers. In addition to this, the Union Budget also envisages considerable structural and power sector tariff reforms.

The MNRE released a draft Renewable Energy Act in July 2015 for comments from various stakeholders. The draft proposes establishment of National Renewable Energy Committee and National Renewable Energy Advisory Group to ensure inter-ministerial coordination and expert assistance. The draft act also defines 'renewable energy sources' as energy derived from non-depleting sources.

Further, the MNRE released a draft Offshore Wind Energy Lease Rules in January 2019 providing a framework of allocation of wind energy blocks to successful bidders through international competitive bidding process. The draft covers installation, commissioning, prospecting of offshore wind energy under lease and also prescribes rights of the lessee and procedure for grant of lease.

Drivers of change

What are the biggest drivers of change in the renewable energy markets in your jurisdiction?

The biggest drivers for development and deployment of new and renewable energy in India are energy security, electricity shortages, energy access and climate change. Additionally, enabling government policy and incentives provided at central and state level as mentioned in question 6 have also provided impetus to the growth of the renewable energy sector in India. To improve rural electrification, which also has an impact on economic and social issues, India has focused on rural electrification and the efforts are currently being undertaken under the Pradhan Mantri Sahaj Bijli Har Ghar Yojana ('Saubhagya', launched in September 2017). The scope of the Saubhagya scheme includes providing solar photovoltaic-based stand-alone systems for unelectrified households located in remote and inaccessible villages and habitations, where grid extension is not feasible or cost-effective.

At the international level, India has been instrumental in the promotion of the International Solar Alliance, a platform for collaboration among sunshine countries seeking to increase production of solar energy. In October 2016, India ratified the Climate Convention at the 2015 United Nations Climate Change Conference (Paris Agreement), which binds parties to take action to reduce greenhouse gas emissions. The Paris Agreement requires parties to propose 'nationally determined contributions' (NDCs) and to base their future efforts on them. One of the key points of emphasis of India's intended NDC for the period 2021 to 2030 is achievement of 40 per cent electrical power installed capacity from non-fossil fuel-based energy resources.

Disputes framework

Describe the legal framework applicable to disputes between renewable power market participants, related to pricing or otherwise.

There are no separate bodies or framework for disputes relating to renewable energy in particular. Jurisdiction over interstate and intrastate electricity regulatory issues is exercised by the CERC and SERCs, respectively. The CERC has the power to adjudicate upon disputes involving generating companies (either owned or controlled by the GOI or that have entered into a composite scheme for generation and sale of electricity in more than one state) or transmission and trading licensees with respect to determination of tariff and regulation of inter-state transmission and trading of electricity. SERCs have the power to adjudicate on disputes between licensees and generating companies within their respective jurisdiction. Both the CERC and SERCs have the authority to refer disputes to arbitration. APTEL is the appellate body and possesses suo moto jurisdiction to examine the validity of any order made by the CERC or SERC. Decisions of APTEL may be challenged before the highest court, the Supreme Court of India. Also, in relation to specific disputes of time extension, in June 2019, the MNRE issued an order regarding setting up of dispute resolution committee to resolve disputes related to:

- appeal against decisions given by SECI/NTPC on extension of time requests based on the contracts executed; and
- requests for extension of time not covered under such contracts.

See question 6 as regards approval accorded to the proposal requiring distribution companies to open and maintain adequate letter of credit as payment security mechanism under power purchase agreements and the MNRE's guidelines stipulating creation of payment security mechanism fund to cover delays in payments by the buying entities.

Utility-scale renewable projects

Project types and sizes

Describe the primary types and sizes of existing and planned utility-scale renewable energy projects in your jurisdiction.

Regarding solar projects, most of the schemes under the NSM provide for deployment of solar photovoltaic (PV) technology. Projects selected are technology-agnostic and allow crystalline silicon or thin film or concentrator PV. Generally, the capacity of each project under NSM is required to be at least 10MW. However, the project capacity may be determined by the implementation agency, depending on the plot size and availability of land in the particular state. For example, the latest auction being conducted by SECI stipulates the minimum size a developer can bid for as 50MW. Concentrated solar power projects are at a nascent stage, and two pilot projects of 50MW each are being undertaken by SECI. The GOI has also projected the solar park model. Solar parks are seeing interest from the private sector as developers are insulated from the major risks relating to land and evacuation. In March 2017, MNRE issued the Scheme for Development of Solar Parks and Ultra Mega Solar Power Projects. A total of 41 solar parks in 21 states with an aggregate capacity of more than 26GW have already been sanctioned. The target of installed capacity from solar parks is 40GW by 2022.

As regards wind energy, the latest auction being conducted by SECI stipulates the minimum and maximum size a developer can bid for as 50MW and 300MW, respectively. Certain states also have stipulated the minimum size a developer can bid for in the auctions being conducted by their state nodal agencies. For example, for tenders conducted in 2018, Gujarat stipulated the minimum size of the project to be 25MW, and Maharashtra stipulated the minimum size of the bid to be 25MW for intra-state projects and 50MW for inter-state projects.

Development issues

What types of issues restrain the development of utility-scale renewable energy projects?

Land availability risks and issues with respect to procurement of land may delay the project and restrain developers from establishing utility-scale renewable energy projects. Further, given the financial health of distribution utilities in India, the offtaker risk is perceived to be a challenge in the development of renewable energy projects. Another major issue is the availability of transmission capacity or evacuation of power from renewable energy projects. In certain projects, the developer is not entitled to any deemed generation in case of a delay due to non-availability of grid or transmission line.

To offset some of these risks in the solar sector, a solar park and solar zone model (as mentioned in question 12) have been proposed where solar tariffs have reduced considerably thanks to the plug and play model. Moreover, the GOI is working to build a green energy corridor to facilitate grid integration of large-scale renewable energy capacity addition.

Hydropower

Primary types of project

Describe the primary types of hydropower projects that are prevalent.

Hydropower plants having capacity of more than 25MW were until recently not considered renewable energy projects. The MOP notified that projects with a capacity of more than 25MW will also be considered as renewable energy. However, the administrative ministry dealing with such projects continues to be the MOP and not MNRE. Owing to the key risks and issues such as deforestation and resettlement, these large-scale hydro projects have a limited private sector participation (restricted to 7.47 per cent of the total participation in the sector). However, small-scale hydropower projects (less than 25MW installed capacity) have the potential to meet the power requirements of remote and isolated areas and have seen increased private sector participation mainly owing to their long useful life and low generation cost. The MNRE has been vested with the responsibility of developing micro (up to 0.1MW), mini (0.101MW to 2MW) and small (2.001MW to 25MW) hydropower projects. Most of the potential from small hydropower projects is in Himalayan areas as river-based projects and in other areas as irrigation canals. Apart from the conventional dams and pumped storage projects, off-grid water mills are prevalent in hilly areas.

What legal considerations are relevant for hydroelectric generation in your jurisdiction?

Total potential of hydro power in India is 2,41,844MW as of January 2019 including pumped storage scheme, and only 45,399.22MW has actually been utilised. Hydro projects are exempted from competitive bidding until August 2022.

Despite these efforts, growth in the small hydropower sector has been relatively slow as compared to wind or solar. Small hydro projects are set up in difficult terrains and often involve private and forested land. Owing to the location in hilly areas, there is a limited working season and thus a relatively longer gestation period. Natural calamities pose high risks during the construction of these projects. Owing to the terrain, the evacuation facilities are

also inadequate.

To set up a small hydropower plant, a developer would have to get the site allotted by the state's revenue department, which can be a time-consuming process. There are several permits or licences required for small hydropower plants that may also delay the construction time of such project and may include:

- techno-economic clearance;
- no objection certificate from state pollution control board;
- no objection certificate from fisheries department;
- water rights by state irrigation department; and
- forest and environment clearance from the Ministry of Environment, Forest and Climate Change.

As per the memorandum dated 8 March 2019, the MOP classified large hydro projects as a renewable energy source. However, large hydro projects will not automatically be eligible for any differential treatment for statutory clearances such as forest clearance, environmental clearance which are available to small hydro projects. While development of small hydro projects is within the purview of the MNRE, the MoP will continue to be the administrative ministry for large hydro projects. Further, the MOP has introduced measures for bringing down the hydropower tariff by providing flexibility to the developers to determine tariff by back loading of tariff after increasing project life to 40 years, increasing debt repayment period to 18 years and introducing escalation of tariff of 2 per cent.

Distributed generation

Prevalence

Describe the prevalence of on-site, distributed generation projects.

To meet certain energy requirements, distributed or decentralised renewable power projects are being established in isolated or areas that have not been electrified. Off-grid or captive power programmes (excluding captive power from biomass non-bagasse cogeneration) account for a total installed capacity of 1.259GW (as of 31 May 2019), which accounts for only 1.54 per cent of the total installed renewable capacity in India. The target from off-grid or captive power (excluding captive power from biomass non-bagasse cogeneration) for the financial year 2018-19 is a mere 0.411GW.

Types

Describe the primary types of distributed generation projects that are common in your jurisdiction.

Solar PV systems (72.82 per cent), waste-to-energy (14.19 per cent) and biomass gasifiers (12.97 per cent) account for the off-grid or captive power programmes (excluding captive power from biomass non-bagasse cogeneration). Family biogas plants, water mills and micro hydel systems, solar street lighting systems, solar lanterns, solar home lighting systems, solar cookers, stand-alone solar or biomass-based power generators and wind pumps are some of the decentralised renewable energy technologies primarily used in rural areas. The MNRE, in August 2018, approved the continuation of the Off-Grid and Decentralised Solar PV Application Programme to achieve an additional 118MWp off-grid solar PV capacity by 2020. This current phase covers the following components: 300,000 solar street lights, stand-alone solar power plants of an individual size up to 25kWp aggregating to 100MWp and 2,500,000 solar study lamps.

In December 2018, the MNRE launched Atal Jyoti Yojana Phase II that proposes the installation of 304,500 solar street lights across India. Further, in November 2018, the MNRE accorded its sanction to implement the central sector scheme, biogas-based power generation thermal application programme and this will be implemented by the agriculture and rural development departments of the states and dairy cooperatives until 2019-20.

Regulation

Have any legislative or regulatory efforts been undertaken to promote the development of microgrids? What are the most significant legal obstacles to the development of microgrids?

Mini or microgrids are one of the key segments of the Off-grid and Decentralised Solar PV Applications Programme of NSM. Capital subsidy is available to solar PV systems for, inter alia, stand-alone and mini or microgrid solar PV power plants in rural and remote areas. Recognising slow growth in the mini or microgrid segment owing to challenges such as high capital expenditure and irregular tariff collection, MNRE notified a programme under which it proposes to provide central financial assistance to empanelled rural energy service providers implementing mini or microgrids in rural areas.

A draft National Policy for Renewable Energy-based Micro and Mini Grids with the aim of encouraging the growth of mini or microgrids was issued for comments from stakeholders in 2016. Under this scheme, the MNRE has targeted the deployment of 10,000 renewable energy-based mini or microgrid projects across India with an installed capacity of 500MW in the next five years. The draft defines microgrids as renewable-based distributed generation, under 10kW, which can operate on a stand-alone basis or connected to the central grid. Minigrids are the same except for a larger capacity (ie, over 10kW). The draft policy encourages states to refer to the principles stated therein for developing their respective programmes and policies. The government of Uttar Pradesh notified the Uttar Pradesh Mini Grid Policy 2016 to promote the decentralised generation of renewable energy by harnessing renewable energy that provides for government subsidies and VGF. The Uttar Pradesh Electricity Regulatory Commission (Mini-Grid Renewable Energy Generation and Supply) Regulations 2016 were notified in April 2016.

The regulations apply to new and existing mini-grid projects (of installed capacity up to 500kWp) for the generation and supply of electricity to consumers and the sale to the distribution licensee in mini-grid areas in the state of Uttar Pradesh. The regulations govern the supply of electricity in rural areas and areas having an inadequate supply of electricity during peak hours and compulsory supply hours by mini-grid operators. Two other states, Jharkhand and Bihar, have proposed a mini-grid policy and regulations for mini grids, respectively.

Certain challenges that impact development of mini or microgrids in India are substantial investments, a long gestation period and the absence of significant market players. Development of mini or microgrids may also seem unviable owing to the grid reaching the area prior to the mini or microgrids being operational. The Tariff Policy recommends the mitigation of this risk by putting in place a regulatory framework for the compulsory purchase of power into the grid from mini or microgrids at a determined tariff.

Other considerations

What additional legal considerations are relevant for distributed generation?

See question 18.

Energy storage

Framework

What storage technologies are used and what legal framework is generally applicable to them?

Batteries (Management and Handling) Rules 2001 under the Environment Protection Act 1986 regulate the manufacture, import, dealing in and recycling of batteries. The Bureau of Indian Standards has issued standards that, inter alia, provide for marking and certification of batteries.

Pursuant to the Bureau of Indian Standards Act 1986, the GOI has notified the Electronics and Information Technology Goods (Requirements for Compulsory Registration) Order 2012, which requires certification for stand-alone UPS or invertors that are less than or equal to 5kVA.

The storage technologies are typically governed by the bid documents. For example, under NSM, SECI invited tenders for setting up grid-connected solar PV projects along with a large-scale battery energy storage system. The selection of the storage system was technology agnostic, that is, the bidders were free to choose any battery storage technology; however, they were required to meet the performance and operating standards as provided in the bid documents, including adherence to international standards.

In September 2017, the GOI notified the Solar Photovoltaics, Systems, Devices and Components Goods (Requirements for Compulsory Registration) Order 2017. The order requires compliance with standards issued by the Bureau of Indian Standards for certain goods and devices such as PV modules, utility interconnected PV inverters and storage batteries. As per the recent Union Budget, the GOI is planning to launch a scheme to invite companies to set up a mega-manufacturing plant in advanced technology areas such as solar photovoltaic cells, lithium storage batteries, solar electric charging infrastructure and provide them investment linked income tax exemptions and other indirect tax benefits.

Development

Are there any significant hurdles to the development of energy storage projects?

Typically, the investment required for setting up a storage facility is considerable. Also, there are environment concerns arising out of the periodical replacement and disposal of chemicals. Further, deployment of large storage systems in urban areas or near sub-stations may bring additional challenges in terms of safety.

Foreign investment

Ownership restrictions

May foreign investors invest in renewable energy projects? Are there restrictions on foreign ownership relevant to renewable energy projects?

The incentives and initiatives of the MNRE are driven with the aim of attracting more investment for financing and development of the renewable energy market in India, keeping in mind the ambitious target set by the GOI. Pursuant to the existing policy, foreign direct investment up to 100 per cent is permitted for companies engaged in non-conventional energy generation. Also, there are no sectoral restrictions or conditions on the acquisition of interest in renewable energy projects in India.

Equipment restrictions

What restrictions are in place with respect to the import of foreign manufactured equipment?

Currently, there are no restrictions on importing foreign manufactured equipment so long as it is compliant with applicable laws and standards.

Projects

General government authorisation

What government authorisations must investors or owners obtain prior to constructing or directly or indirectly transferring or acquiring a renewable energy project?

Under the Electricity Act, generation of energy is a delicensed activity. Prior to the construction of a project, certain site-specific approvals may be required (if applicable) such as forest clearance and approvals from defence establishments, the Airports Authority of India and the Archaeological Survey of India.

Projects are required to comply with technical standards prescribed by the CEA, including those in relation to construction, safety and maintenance. In order to commence commercial operations, the following approvals may also be required: electrical safety approval from the CEA; commissioning certificate; and power evacuation approval.

Typically, environmental impact assessment studies are not required for renewable energy projects except for offshore wind power projects, biomass power plants and municipal waste plants exceeding certain capacity. The classification of industrial sectors by Central Pollution Control Board recognises solar power generation through solar PV cells, wind power and mini hydel power as non-polluting industries. Such industries are classified in the ‘white’ category and thus consents from pollution control boards under the Air (Prevention and Control of Pollution) Act 1981 and Water (Prevention and Control of Pollution) Act 1974 are not required.

Additionally, micro-level corporate, labour and employment and land revenue approvals may be required.

Offtake arrangements

What type of offtake arrangements are available and typically used for utility-scale renewables projects?

The largest offtakers in India are the distribution utilities, and one of the key risks for a project developer is the offtaker risk. Certain distribution utilities in India at present do not have good credit ratings and are under financial stress that has led to accumulation of debt. The financial health of distribution utilities has posed an impediment for project developers entering into offtake arrangement. To offset such risks, in one of the tenders for a solar energy park, a state government offered a guarantee to secure offtaker default. The GOI launched Ujwal Discom Assurance Yojana in 2015 for financial turnaround and the operational improvement of distribution utilities. Also, to mitigate such offtaker risk, certain MNRE schemes establish NTPC Limited and SECI as counterparties to the power purchase agreements (PPA), since they have a better credit rating than some of the distribution utilities.

Procurement of offtaker agreements

How are long-term power purchase agreements procured by the offtakers in your jurisdiction? Are they the subject of feed-in tariffs, the subject of multi-project competitive tenders, or are they typically developed through the submission of unsolicited tenders?

A renewable energy developer may enter into a PPA with central, stateand private distribution utilities, third parties or captive users. Pursuant to the Electricity Act, a distribution utility can either procure powerthrough bilateral or negotiated PPAs or through a transparent process of competitive bidding conducted in accordance with the bidding guidelines notified by the GOI. The appropriate commission is required toadopt the tariff discovered through bidding. In the case of bilateral or negotiated PPAs, the tariff and terms and conditions of sale of power are subject to a prudence check and approval of the appropriatecommission. Long-term offtake agreements through the competitive bidding route are typical for solar power and, to streamline the process, in August 2017, the MNRE issued the Guidelines for Tariff BasedCompetitive Bidding for Grid Connected Solar Photovoltaic Projects. Generally, wind projects have been awarded based on feed-in tariffs. However, the competitive bidding route has been adopted, at bothcentral and state level, for procuring power. The MOP, in December 2017, issued the Guidelines for Tariff Based Competitive Bidding Process for Procurement of Power from Grid Connected Wind Power Projects. SECI has been designated as the nodal agency for implementation of the MNRE schemes, from time to time, for setting up wind power projects connected to the Inter-State Transmission System. To date, SECI has conducted or is conducting tendering for 8,500MW capacity of such wind power projects. The Tariff Policy envisages the procurement of power from renewable energy sources by distribution utilities only through competitive bidding from a date to be notified by the GOI, except for certain projects. The tariff for hydropower developers is determined by the CERC or SERCs on a cost-plus basis, allowing for a fixed return on equity.

Operational authorisation

What government authorisations are required to operate a renewable energy project and sell electricity from renewable energy projects?

See question 24.

Decommissioning

Are there legal requirements for the decommissioning of renewable energy projects? Must these requirements be funded by a sinking fund or through other credit enhancements during the operational phase of a renewable energy project?

On decommissioning, all municipal and environmental laws with respect to disposal of equipment need to be complied with. Also, SECI has issued an environmental and social management framework which also prescribes conditions for decommissioning of specific solar and hybrid technology projects. The National Offshore Wind Energy Policy 2015 notified by the MNRE, empowers the NIWE to impose conditions requiring the developer to submit a decommissioning and site restoration programme when granting a lease for a proposed offshore wind farm. The programme is made a part of an environmental impact assessment study, and a deposit or a financial guarantee must be submitted by the developer to ensure proper decommissioning. The Guidelines for Development of Onshore Wind Power Projects 2016 also require a wind power project to have a decommissioning plan. The NIWE is entrusted to formulate guidelines for decommissioning wind turbines.

There are no restrictions on the choice of funding for decommission costs (ie, through a sinking fund or through other credit methods).

Transaction structures

Construction financing

What are the primary structures for financing the construction of renewable energy projects in your jurisdiction?

Equity is one of the major sources of financing the construction of renewable energy projects. The standard bidding documents for solar power issued by central and state nodal agencies prescribe minimum capital to be invested in a solar power project through equity investment. Another major constituent of financing is debt from banks and financial institutions (term loans and external commercial borrowings) and other debt instruments such as debentures. Recently, financing is also obtained by way of rupee-denominated bonds, also known as masala bonds and green bonds.

The GOI also provides financial benefits for specific projects pursuant to schemes such as VGF for certain solar projects. For timely and adequate credit for renewable energy projects, banks in India are required to treat loans up to 150 million rupees as priority sector lending. However, the MNRE is in talks with India’s central bank following for removal of the priority sector lending limit for renewable energy sector which will encourage banks to lend more for renewable energy projects and help developers access easy finance. Further, banks and financial institutions are being asked to tie up with SECI for offering predetermined loans to successful bidder.

Operational financing

What are the primary structures for financing operating renewable energy projects in your jurisdiction?

Working capital loans from banks and financial institutions and internal accruals are the primary structures for financing operating renewable energy projects.

Updates & Trends

Recent developments

Describe any market trends with respect to development, financing or operation in the renewables sector or other pertinent matters.Describe any notable pending or anticipated legislative proposals.

Market trends31 Describe any market trends with respect to development, financing or operation in the renewables sector or other pertinent matters.

India has set a target to achieve 175GW of installed capacity of renewable energy by 2022. The total installed capacity of renewable energy projects (including off grid and captive power) and large hydro projects reached 81.72GW and 45.39GW respectively as of June 2019. The GOI has been actively promoting renewable energy sources and has been taking steps to provide enabling framework for the sector. To achieve the target of 175GW, the MNRE, in consultation with the CEA and central transmission utility, has identified transmission schemes for around 66.5GW of renewable energy generation projects, for early regulatory approval by the CERC for transmission. For projects that are yet to be awarded to the successful bidder, prior requirement of long-term access and associated bank guarantees are required to be deferred until such projects are awarded. Pursuant to its order in February 2019, the MNRE issued payment security guidelines to ensure timely payment to developers that sign power purchase agreements with SECI. The payment security fund of 5 billion rupees has been sanctioned to cover energy payment risk of grid connected solar PV projects under the MNRE's VGF schemes.

Also, the MNRE, in June 2019, issued an order regarding the setting up of dispute resolution mechanism to resolve expeditiously, unforeseen disputes that may arise beyond the scope of contractual agreements between solar power developers and wind power developers and SECI and NTPC. To achieve the target of 100GW of solar energy by 2022, floating solar power projects have also been planned and bids have been invited by SECI.

Further, to boost investment in the electricity sector and specifically the renewable energy space, as per the recent Union Budget, the GOI intends to launch a scheme for setting up manufacturing plants in advanced technology areas such as solar photo voltaic cells, lithium storage batteries, solar electric charging infrastructure (see question 11). While there has been an impetus to promote renewable energy generation, in certain states in India, such as Andhra Pradesh, the distribution companies have expressed their intention to renegotiate the tariff and bring down the costs under the solar and wind power purchase agreements.

Legislative proposals32 Describe any notable pending or anticipated legislative proposals.

See question 9.

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