India

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MARKET FRAMEWORK

Government electricity participants

1 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 (the 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.

The Central Electricity Authority 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 the 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 concerning 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, biogas units, small hydel power, tidal energy, geothermal energy, and so on. 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 the Solar Energy Corporation of India Limited (SECI) and NTPC Limited.

SECI is a GoI enterprise that facilitates the implementation of renewable energy projects including the National Solar Mission (NSM). It is responsible for the implementation of certain MNRE schemes, the major ones being the viability gap funding (VGF) schemes for large-scale grid-connected projects, solar park and ultra-mega solar power projects 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 research and development institutions in the field of solar, wind and bio-energy, respectively. The NIWE has also been notified as the nodal agency for the development of offshore wind energy in India.

Private electricity participants

2 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 (the 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 95.76 per cent of the installed capacity of the grid interactive power in renewable energy (as of 30 April 2021).

Definition of 'renewable energy'

3 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 in March 2019, the MoP classified hydropower project stations with a capacity of more than 25MW as a renewable energy source.

Framework

4 | 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, 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 hydro-power 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 has also been specified in the draft Electricity (Amendment) Bill 2020, 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. 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. The GoI has also introduced the Green Term Ahead Market, a short-term power market for renewable energy such that 'obligated entities' can meet their RPO compliance requirements.

Stripping attributes

5 | Can environmental attributes be stripped and sold separately?

RECs can be sold on a market discovered price within a price band fixed by 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

6 | 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 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 an 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.

Under the Tariff Policy, 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, given a shorter gestation period of renewable energy projects, the GoI has issued directions to 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 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. Under 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. In May 2018, the MNRE released the National Wind Solar Hybrid Policy, with the view to encourage setting up of hybrid wind and solar plants.

The MNRE also handles the rooftop solar programme. Rooftop Phase-I of this programme was launched in 2015 in which incentives and subsidies were provided for residential, institutional and social sectors. Rooftop Phase-II was launched in February 2019 with a target of achieving cumulative capacity of 40GW MW by 2022. Under the rooftop solar scheme, central financial assistance of 40 per cent for rooftop systems up to 3kW capacity and 20 per cent for capacity above 3kW and up to 10kW is provided. As of March 2021, more than 3.7GW capacity of rooftop solar capacity has been estimated to have been installed in India and 2.6GW capacity is under installation in the residential segment.

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 an adequate letter of credit as a payment security mechanism under power purchase agreements. Further, concerning specific disputes of time extension, the MNRE, in June 2019, issued an order regarding the setting up of a dispute resolution committee to resolve disputes related to appeals against decisions given by SECI and NTPC on the extension of time requests based on the contracts executed and requests for extension of time not covered under such contracts.

7 | 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. The GoI has provided various tax and fiscal incentives to electricity generated from specific energy sources such as accelerated depreciation. 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 a 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.

Purchasing mechanisms

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

To promote renewable energy sources, the Tariff Policy envisages a renewable generation obligation. Under 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 a generator will be bundled with its thermal generation for sale. If an entity that is mandated to comply with RPO procures this renewable power, then such an 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 or SERCs. Buying of such power shall count towards the RPO of such entities. Further, to ensure connectivity to renewable energy sources, CERC approved the revised detailed procedure in February 2021 made under 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 applies 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

9 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 2018 requires coal (including lignite) thermal generating stations to set up a renewable energy station or procure energy from renewable energy sources, provides for the imposition of penalty in case of non-compliance with the renewable purchase obligation, and envisages preparing of National Renewable Energy Policy.

The draft Electricity (Amendment) Bill, 2020 (Draft Bill 2020) provides enabling framework for GoI to issue a Renewable Energy Policy specifically for promoting the generation of electricity from renewable sources of energy. While the Electricity Act provides for SERCs to specify RPO, the Draft Bill proposes that SERCs specify RPO and HPO as may be prescribed by the GoI, from time to time. Further, if the CERC or SERCs fail to determine tariff within 60 days from the date of application, the Draft Bill 2020 provides for deemed adoption of tariff by the CERC or SERCs. Regarding the dispute resolution process, Draft Bill 2020 envisages the setting up of an electricity contract enforcement authority to adjudicate upon matters related to the performance of obligations under contracts related to sale, purchase or transmission of electricity.

The MNRE had earlier released a draft Renewable Energy Act in July 2015 for comments from various stakeholders. The draft proposed the establishment of the National Renewable Energy Committee and the National Renewable Energy Advisory Group to ensure inter-ministerial coordination and expert assistance. The draft also defined 'renewable energy sources' as energy derived from non-depleting sources. Further, 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 an international competitive bidding process. The draft covered installation, commissioning, prospecting of offshore wind energy under lease and also prescribes rights of the lessee and procedure for grant of a lease.

Drivers of change

10 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 have also provided an 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 the 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 to achieve 40 per cent electrical power installed capacity from non-fossil fuel-based energy resources.

Disputes framework

11 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 intra-state electricity regulatory issues is exercised by the CERC and SERCs, respectively. 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 concerning the 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 CERC and SERCs have the authority to refer disputes to arbitration. The Appellate Tribunal for Electricity (APTEL) is the appellate body and possesses suo moto jurisdiction to examine the validity of any order made by CERC or SERCs. Decisions of APTEL may be challenged before the highest court, the Supreme Court of India. Also, concerning specific disputes of time extension, the MNRE, in June 2019, issued an order regarding setting up of dispute resolution committee to resolve disputes related to appeal against decisions given by SECI and NTPC on the extension of time requests based on the contracts executed; and requests for extension of time not covered under such contracts. On 20 September 2019, the MNRE issued the procedural guidelines for effectuating the dispute resolution mechanism.

UTILITY-SCALE RENEWABLE PROJECTS

Project types and sizes

12 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 National Solar Mission (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 the Solar Energy Corporation of India Limited (SECI) stipulates the minimum size a developer can bid for as 50MW. The government of India (GoI) has also projected the solar park model to set up projects in a plug-and-play model. Solar parks are seeing interest from the private sector as developers are insulated from the major risks relating to land and evacuation. A total of 38 solar parks in 15 states with an aggregate capacity of over 25GW are under development under the Scheme for Development of Solar Parks and Ultra Mega Solar Power Projects.

As regards wind energy, the latest auction being conducted by SECI stipulates the minimum size a developer can bid for as 50MW. For intra-state projects, states also stipulate the minimum size a developer can bid for in the auctions being conducted by their state nodal agencies.

Development issues

13 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 owing 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 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 of transmission and evacuation infrastructure to facilitate grid integration of large-scale renewable energy capacity addition.

HYDROPOWER

Primary types of project

14 Describe the primary types of hydropower projects that are prevalent.

Hydropower plants having capacity of more than 25MW were till recently not considered renewable energy projects. The Ministry of Power (MoP) notified by way of an office memorandum dated 8 March 2019 that projects with a capacity of more than 25MW will also be considered renewable energy sources. However, the administrative ministry dealing with such projects continues to be MoP and not the Ministry of New and Renewable Energy (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 7.55 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.

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

The total potential of hydropower in India is 2,41,844MW as of January 2019, including pumped storage scheme. As of 30 April 2021, 46,209.22MW has been utilised in the form of projects over 25MW capacity and 4786.81MW has been utilised in the form of small hydro projects. 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 would continue requiring all statutory clearances unlike small hydro projects. While the 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 the tariff by the backloading of

tariff after increasing the project life to 40 years, increasing the debt repayment period to 18 years and introducing an escalation of the tariff of 2 per cent.

DISTRIBUTED GENERATION

Prevalence

16 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 un-electrified areas. Off-grid or captive power programmes (excluding captive power from biomass non-bagasse cogeneration) account for a total installed capacity of 1341.64 MW (as of 28 February 2021), which accounts for only 1.44 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 2020–21 was a mere 510MW.

Types

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

Solar PV systems (83.74 per cent) and waste-to-energy (16.25 per cent) account for the off-grid or captive power programmes. 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. In April 2020, the Ministry of New and Renewable Energy (MNRE) approved the continuation of the Off-Grid and Decentralised Solar PV Application Programme Phase III, which is aimed at providing solar PV based applications in areas where grid power is either not available or is unreliable until 31 March 2021. This current phase covers the following components: 300,000 solar streetlights, 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, which envisages installation of 304,500 solar streetlights across India. Further, in November 2018, the MNRE accorded its sanction to implement central sector scheme, biogas-based power generation thermal application programme and such programme will be implemented by the agriculture and rural development departments of the states and dairy cooperatives until 2019-20.

The PM-KUSUM scheme is one of the largest initiatives in the world to provide clean energy to more than 3.5 million farmers by solarising their agriculture pumps. It aims to install grid-connected ground-mounted solar power plants (up to 2MW) aggregating to a total capacity of 10GW; install 2 million standalone solar pumps and solarise 1.5 million grid-connected agricultural pumps. All components combined would support the installation of additional solar capacity of 30.8GW.

Regulation

18 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 the National Solar Mission. 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.

In December 2019, the MNRE issued Guidelines for Development of Decentralised Solar Power Plants to promote the production of solar energy near sub-stations and to ensure the availability of affordable and reliable solar power in the rural areas of India. The guidelines are applicable for the procurement of solar power by distribution companies from, among others, decentralised solar power plants of capacity more than 2MW connected to distribution sub-stations of rating 66/11KV and higher.

A draft National Policy for Renewable Energy-based Micro and Mini-Grids to encourage 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. Mini-grids are the same except for 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 viability gap funding. 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.

Other considerations

19 What additional legal considerations are relevant for distributed generation?

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.

ENERGY STORAGE

Framework

20 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.

Under the Bureau of Indian Standards Act 1986, the government of India (GoI) has notified the Electronics and Information Technology

Goods (Requirements for Compulsory Registration) Order 2012, which requires certification for stand-alone uninterruptible power supply or invertors that are less than or equal to 5kVA.

The storage technologies are typically governed by the bid documents. For example, under the National Solar Mission, the Solar Energy Corporation of India Limited 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. The GoI is envisaging 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

21 | 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

22 | 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 Ministry of New and Renewable Energy 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 government of India. 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 an interest in renewable energy projects in India.

Similar to other sectors, an entity of a country that shares a land border with India (or where the beneficial owner of an investment into India is situtated in or is a citizen of any such country), can invest only under the government route. For processing such foreign direct investment (FDI) proposals, an FDI cell has been created in the Ministry of New and Renewable Energy in June 2020.

Equipment restrictions

23 | 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

24 | 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, the 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 Central Electricity Authority (CEA), including those in relation to construction and safety. 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 the 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

25 | 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 government of India (GoI) provides liquidity infusion from time to time for financial turnaround and the operational improvement of distribution utilities to help clear outstanding dues. Also, to mitigate such offtaker risk, certain Ministry of New and Renewable Energy (MNRE) schemes establish NTPC Limited and the Solar Energy Corporation of India Limited (SECI) as counterparties to the power purchase agreements (PPAs), since they have a better credit rating than some of the distribution utilities.

Procurement of offtaker agreements

26 | 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, state and private distribution utilities, third parties or captive users. Pursuant to the Electricity Act, a distribution utility can either procure power through 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 to adopt 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 appropriate commission.

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 Based Competitive 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 both central and state level, for procuring power. The Ministry of Power, 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 the implementation of the MNRE schemes for setting up wind power projects connected to the Inter-State Transmission System. SECI had conducted tendering for around 9300MW capacity of such wind power projects up to December 2019. Further, approximately 10936MW capacity solar projects are being implemented by SECI under various schemes as of April 2021.

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 Central Electricity Regulatory Commission or State Electricity Regulatory Commissions on a cost-plus basis, allowing for a fixed return on equity.

Operational authorisation

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

Out of the total approvals or permits required for renewable energy projects, majority of such permits are related to and are required until commissioning of the projects. Thereafter, the projects are required to comply with technical standards prescribed by the CEA in relation to maintenance of the projects. Further, there are operational level compliances including those under the labour and employment permits that need to be carried out routinely

Decommissioning

28 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 the 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 National Institute of Solar Energy, National Institute of Wind Energy (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 decommissioning costs (ie, through a sinking fund or other credit methods).

TRANSACTION STRUCTURES

Construction financing

29 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 government of India also provides financial benefits for specific projects pursuant to schemes such as the viability gap funding scheme 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 Ministry of New and Renewable Energy is in talks with India's central bank regarding the removal of the priority sector lending limit for the 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 the Solar Energy Corporation of India Limited for offering predetermined loans to the successful bidder.

Operational financing

30 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.

UPDATE AND TRENDS

Recent developments

31 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 31 December 2022. The total installed capacity of renewable energy projects (including off-grid and captive power) and large hydro projects reached 95.01GW and 46.2GW respectively as of April 2021. The percentage share of renewable energy in total installed capacity has risen from 14.36 per cent in 2014–15 to 24.53 per cent in 2020–21. Similarly, the percentage share of renewable energy in generation has also doubled to 11 per cent in the same period. The government of India (GoI) has been actively promoting renewable energy sources and also has been taking steps to provide an enabling framework for the sector. To achieve the above target of 175GW, the Ministry of New and Renewable Energy (MNRE), in consultation with the Central Electricity Authority and central transmission utility, has identified transmission schemes for around 66.5GW of renewable energy generation projects, for early regulatory approval by the Central Electricity Regulatory Commission for transmission.

To boost investment in the electricity sector and specifically renewable energy space, the GoI intends to replace conventional energy meters with prepaid smart meters in the next couple of years.

In October 2020, the MNRE issued the Guidelines for Tariff Based Competitive Bidding Process for Procurement of Power from Grid Connected Wind Solar Hybrid Projects to provide a framework for the procurement of electricity from wind–solar hybrid power projects by distribution licensees through a transparent bidding process at competitive rates in a cost-effective manner. These guidelines further provide for hybrid projects to be backed by storage facilities to reduce the variability of output power and ensure the availability of firm power for a particular period. Currently, 1,440MW capacity of wind-solar hybrid projects is under implementation in Rajasthan and Tamil Nadu.

Similarly, the GoI issued the Guidelines for Tariff Based Competitive Bidding Process for Procurement of Round-The Clock Power from Grid Connected Renewable Energy Power Projects on 22 July 2020 to provide round-the-clock power to distribution companies from renewable energy sources (the guidelines define 'renewable energy sources' to mean power from solar and wind power generating systems, or a combination, with or without energy storage system) complemented or balanced with coal-based thermal power.

Additionally, on 5 August 2020, the GOI waived the inter-state transmission charges and losses on the transmission of electricity generated from eligible solar and wind projects, for sale to entities, till 30 June 2023, for a period of 25 years from the date of commissioning, subject to meeting the requirements.

The distribution companies of certain states such as Andhra Pradesh and Punjab have expressed their intention to renegotiate the tariff to bring down the costs under power purchase agreements relating to renewable energy projects. However, the MNRE has intervened and advised the states to honour such power purchase agreements.

The MNRE is engaged and participating in implementing One-Sun-One-World-One-Grid, the concept of which is to interconnect generators and loads across continents with an international power transmission grid. A memorandum of understanding between the International Solar Alliance, the GoI and the World Bank was signed in September 2020 to implement the initiative. Currently, a long-term vision, implementation plan, road map and institutional framework is being developed by the International Solar Alliance, which will implement this project.

32 Describe any notable pending or anticipated legislative proposals.

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 2018 requires coal (including lignite) thermal generating stations to set up a renewable energy station or procure energy from renewable energy sources, provides for the imposition of penalty in case of non-compliance with the renewable purchase obligation, and envisages preparing of National Renewable Energy Policy.

The draft Electricity (Amendment) Bill, 2020 (Draft Bill 2020) provides enabling framework for the GoI to issue a Renewable Energy Policy specifically for promoting the generation of electricity from renewable sources of energy. While the Electricity Act provides for State Electricity Regulatory Commissions (SERCs) to specify renewable purchase obligations (RPOs), the Draft Bill proposes that SERCs specify RPO and hydropower purchase obligations as may be prescribed by the GoI, from time to time. Further, if the Central Electricity Regulatory Commission (CERC) or SERCs fail to determine tariff within 60 days from the date of application, the Draft Bill 2020 provides for deemed adoption of tariff by the CERC or SERCs. Regarding the dispute resolution process, Draft Bill 2020 envisages the setting of up an electricity contract enforcement authority to adjudicate upon matters related to the performance of obligations under contracts related to the sale, purchase or transmission of electricity.

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The MNRE released a draft Renewable Energy Act in July 2015 for comments from various stakeholders. The draft proposes the establishment of the National Renewable Energy Committee and the 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 an international competitive bidding process. The draft covers installation, commissioning, prospecting of offshore wind energy under lease and also prescribes the rights of the lessee and the procedure for grant of a lease.

Additionally, the Ministry of Power released a draft of the National Electricity Policy in April 2021 which, among other things, laid emphasis on hydroelectricity and non-conventional sources of energy.