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Renewable Energy

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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 (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.

Pursuant to the Electricity Act, the regulatory commissions – the Central Electricity Regulatory Commission (CERC) and the State Electricity Regulatory Commissions (SERCs) – have been established at the central and state level, respectively, to regulate electricity procurement, determine tariffs and adjudicate upon disputes.

The Ministry of Power (MoP) is the administrative ministry of the Indian government (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 as Renewable Energy Implementing Agencies to implement the schemes, including Solar Energy Corporation of India Limited (SECI), NTPC Limited, NHPC Limited and SJVN 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, and 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.

Law stated - 1 July 2024

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 (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. As at 31 May 2024, they account for 69 per cent of the installed capacity of grid-interactive power in renewable energy (including large hydropower).

Law stated - 1 July 2024

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 is other legislation and policy 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, 2024 defines 'renewable energy' as electricity generated from renewable energy sources. The term 'renewable energy source' has been further defined to include hydro, wind and solar, including its integration with combined cycle, biomass, biofuel cogeneration, urban or municipal waste, and such other sources as recognised or approved by the central government.

Law stated - 1 July 2024

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 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.

The RPOs can also be discharged by purchase of environmental attributes sold as intangible energy commodities called renewable energy certificates (REC).

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, and each REC represents 1 megawatt hour of energy injected into the grid from renewable energy sources.

To ensure compliance by entities obligated under the RPO regime to purchase RECs, the 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 that appropriate actions are 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.

A technology multiplier is assigned to renewable power projects based on the source of renewable power. Accordingly, an onshore wind or onshore solar power project which generates 1 MW power is entitled to 1 REC. However, for a similar amount of hydro power produced the REC multiplier is 1.5. Similarly, the REC multiplier is 2 for municipal solid waste and 2.5 for bio-mass and biofuel.

Law stated - 1 July 2024

Stripping attributes

Can environmental attributes be stripped and sold separately?

RECs can be sold at 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).

In December 2022, the Central Electricity Regulatory Commission (Terms and Conditions for Renewable Energy Certificates for Renewable Energy Generation) Regulations 2022 came into force. Pursuant to these regulations, RECs are made valid in perpetuity (until they are redeemed), and trading in renewable energy certificates is allowed through traders

in addition to power exchanges. An REC, once exchanged through power exchange(s) or through electricity traders and used for RPO compliance by the obligated entities, shall stand redeemed.

Law stated - 1 July 2024

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 National Electricity Policy 2005 broadly encourage energy from renewable sources. The MNRE administers the NSM, the National Offshore Wind Energy Policy, and the Policy for Repowering of the Wind Power Projects as energy source-specific policies.

The MoP notified the Electricity (Promotion of Generation of Electricity from Must-Run Power Plant) Rules 2021, which provide that a wind, solar, wind-solar hybrid or hydropower plant (in case of excess water leading to spillage) or a power plant from any other sources, as may be notified by the appropriate government, which has entered into an agreement to sell the electricity to any person, shall be treated as a must-run power plant. Further, the Rules state that a must-run power plant will not be subjected to curtailment or regulation of generation or supply of electricity on account of merit order dispatch or any other commercial consideration except technical constraint in the electricity grid or for reasons of security of the electricity grid.

To promote the sector, the GoI has exempted payment of interstate transmission (ISTS) charges on the transmission of electricity generated from wind and solar energy projects for a period of 25 years from commission of the projects, provided that the projects are commissioned up to 30 June 2025. To encourage capacity addition in battery storage projects, waiver of ISTS charges is allowed for battery energy storage system (BESS) projects if at least 70 per cent of the annual electricity generation requirement of the BESS system charging is met through the use of solar and wind power. Similarly, to encourage capacity addition in pumped storage projects, waiver of ISTS charges is allowed for hydro-pumped storage plants provided that at least 70 per cent of the annual electricity generation requirement of the plant's water pumping is met through the use of solar and wind power.

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 (megawatt) 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 Grid Connected Solar Rooftop Programme, which has the objective of installing 40GW (gigawatts) of grid-connected rooftop solar projects. Currently, Phase II of the programme is operational and will continue until 31 March 2026. Under

the programme, central financial assistance (CFA) is provided to residential electricity consumers and distribution companies.

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, the MNRE has set up a Dispute Resolution Committee (DRC) regarding dealing with disputes between the MNRE's renewable energy implementing agencies (REIAs) – such as SECI, NTPC, NHPC and SJVN – and developers. These disputes include disputes relating to extension of time in project schedules due to force majeure events, disputes relating to extension of time not covered under the terms of contract and disputes other than those pertaining to extension of time between the REIAs and developers. The DRC submits its recommendations to the MNRE, which are examined by the MNRE; and the same, along with the MNRE's observations thereupon, are placed before the Minister for the final decision. The mechanism of the DRC envisages expeditious resolution of disputes. The state governments have also been requested by the MNRE to consider setting up similar mechanisms for dispute resolution in respect of renewable energy projects directly bid out by them.

Law stated - 1 July 2024

Government incentives

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.

Law stated - 1 July 2024

Purchasing mechanisms

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. 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 RPOs procures this renewable power, then such an entity would be considered to have met the RPOs.
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 CERC or SERCs. Buying of such power shall count towards the RPOs of such entities. The government is considering the proposal to mandate the renewable generation obligation.

Further, to ensure connectivity to renewable energy sources, CERC approved the revised detailed procedure in February 2021 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 interstate 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.

Law stated - 1 July 2024

Legislative proposals

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

The MoP has from time to time proposed amendments to the Electricity Act 2003. At present, there are no bills pending with the Union Parliament.

Law stated - 1 July 2024

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 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 to 2030 is to achieve approximately 50 per cent electrical power installed capacity from non-fossil fuel-based energy resources (figure updated in August 2022). India also committed to achieving net zero carbon emissions by 2070 at the United Nations Climate Change Conference (Glasgow).

The National Hydrogen Mission has been launched, with the aim of facilitating the production of 5 million tonnes of green hydrogen by 2030 and the related development of renewable energy capacity. In February 2022, the Ministry of Power issued its Green Hydrogen Policy, under which green hydrogen and green ammonia are defined as hydrogen and ammonia produced by way of electrolysis of water using renewable energy, including renewable energy that has been banked or produced from biomass. The policy seeks to incentivise developers to expedite the development of green hydrogen and green ammonia projects and provides incentives such as the waiving of ISTS charges for a period of 25 years for green hydrogen and ammonia projects commissioned before 30 June 2025. In January 2023, the GoI released its National Green Hydrogen Mission and committed 197.44 billion rupees towards the production, utilisation and export of green hydrogen and its derivatives. The MNRE has been given responsibility for coordinating and implementing the National Hydrogen Mission. The development of green hydrogen projects should be a key driver of change for the development of the renewable energy capacity required for electrolysis. The National Hydrogen Mission pegs the renewable energy capacity addition, for supplying power to such green hydrogen projects, as 125GW by the end of fiscal year 2030.

The MoP has issued the revised scheme for flexibility in generation and scheduling of thermal/hydropower stations through bundling with renewable energy and storage power. Further, the MoP has issued an order to chart the trajectory for replacement of thermal energy with about 58,000MU (million units) (30,000MW) of renewable energy by 2025–2026. Pursuant to this, a year-wise trajectory is provided for the relevant sectors, namely, 33,260MU for central, 12,386MU for states and 12,224MU for the private sector.

Law stated - 1 July 2024

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 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 interstate 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, 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 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.

Law stated - 1 July 2024

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 National Solar Mission (NSM) provide for the deployment of solar PV (photovoltaic) 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 tender for the selection of developers to set up solar power projects (ISTS Tranche XVI) being conducted by the Solar Energy Corporation of India Limited (SECI) stipulates the minimum size a developer can bid for as 50MW.

The Indian government (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. As at the end of 2022, 57 solar parks have been sanctioned with a cumulative sanctioned capacity of 39.28GW in 13 states. Solar power projects of an aggregate capacity of over 10GW have been commissioned in 17 parks.

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

For hybrid tenders, the latest tender for the selection of developers to set up wind-solar hybrid power projects (Tranche IX) being conducted by the Solar Energy Corporation of India Limited (SECI) stipulates the minimum size a developer can bid for as 50MW.

Law stated - 1 July 2024

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.

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. Additionally, the Electricity (Promotion of Generation of Electricity from Must-Run Power Plant) Rules 2021 require that in the event of a curtailment of supply from a must-run power plant, compensation is required to be payable by the procurer to the must-run power plant at the rates specified in the agreement for purchase or supply of electricity.

Law stated - 1 July 2024

HYDROPOWER

Primary types of project

Describe the primary types of hydropower projects that are prevalent.

As at 31 May 2024, the installed capacity of hydroelectric power plants in the country is 51,933.42MW, which is equal to 11.67 per cent of the total installed capacity of India. As at 31 May 2023, the pumped storage projects-based installed capacity in India is 4,745.6MW.

Until recently, hydropower plants with a capacity of more than 25MW were not considered renewable energy projects. The Ministry of Power (MoP) notified by way of an office memorandum in 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 the MoP and not the Ministry of New and Renewable Energy (MNRE). Owing to key risks and issues such as deforestation and resettlement, these large-scale (above 25MW) hydro projects have limited private sector participation (restricted to 8.37 per cent of the total participation in the sector).

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 costs. 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. In addition to conventional dams and pumped storage projects, off-grid water mills are prevalent in hilly areas.

The government estimates that India would require 26.7GW of pumped storage projects to integrate the renewable energy capacity envisaged until 2032. Therefore, due to this higher focus on energy storage, pumped storage projects are expected to become the mainstay in hydropower for 2027–2032. In this regard, the MoP on 10 April 2023 issued guidelines to promote the development of pumped storage projects.

Law stated - 1 July 2024

Primary types of project

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

Growth in the hydropower sector has been relatively slow compared with wind or solar. 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, and evacuation facilities are inadequate due to the terrain.

Site allotment for hydropower plants can be a time-consuming process. There are several permits or licences required for hydropower plants, which may also delay the construction time of such project, and which 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.

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. With the objective to add 30GW of hydropower by 2029–2030, the MoP issued the long-term trajectory for hydropower purchase obligation.

Law stated - 1 July 2024

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 un-electrified areas. As of 31 December 2022, the capacity of off-grid solar PV plants is 217MW.

Law stated - 1 July 2024

Types

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

Solar PV systems and waste-to-energy account for the majority 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.

The Ministry of New and Renewable Energy (MNRE) has implemented schemes like Atal Jyoti Yojana (AJAY) and the Off-Grid and Decentralised Solar PV Application Programme, which were aimed at providing solar PV-based applications (solar streetlights, stand-alone solar power plants and solar study lamps) in areas where grid power was unavailable or unreliable.

The PM-KUSUM scheme is an initiative 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 capacity of 10GW; install 2 million standalone solar pumps; and solarise 1.5 million grid-connected agricultural pumps. The scheme will be operational until 31 March 2026.

Law stated - 1 July 2024

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?

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 with capacity of more than 2MW connected to distribution sub-stations of rating 66/11 kilovolts 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, but there has been no progress since then. The draft defines microgrids as renewable-based distributed generation under 10kW (kilowatts) that 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.

Certain states have however notified their own policies to promote decentralised generation of renewable energy. The government of Uttar Pradesh notified the Uttar Pradesh

Mini-Grid Policy 2016, which envisages provision of 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 500 kilowatts peak) 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.

Law stated - 1 July 2024

Other considerations

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 2016 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.

Law stated - 1 July 2024

ENERGY STORAGE

Framework

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

The Battery Waste Management Rules 2022, under the Environment Protection Act 1986, regulate the manufacture, import, dealing in and recycling of batteries and imposes an extended producer responsibility on producers (including importers) of batteries (either through themselves or third parties) to collect and recycle/refurbish waste batteries and use recovered materials in new 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 Indian government (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 5 kilovolt amperes.

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.

Law stated - 1 July 2024

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.

Law stated - 1 July 2024

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 Ministry of New and Renewable Energy (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 Indian government. 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 situated 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 was created in the MNRE in June 2020. Further, as per the recent amendments, restrictions apply to individuals who are nationals of a country that shares a land border with India and intend to occupy directorship positions in a company incorporated in India – a person in this category is now required to obtain a prior security clearance from the Ministry of Home Affairs, if seeking to be appointed as a director of an Indian entity.

Law stated - 1 July 2024

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. Separately, to ensure reliability of solar PV manufacturers, protect consumer interests and ensure India's energy security, the MNRE issued Approved Models and Manufacturers of Solar Photovoltaic Modules (Requirements for Compulsory Registration) Order 2019, which provides for issuance of a list of models and manufacturers of solar PV cells and modules that comply with national standards; relevant solar equipment for new projects in India is to be sourced based on the manufacturers and models mentioned in the list; there are different dates for the implementation of the Order, based on the different types of project.

Law stated - 1 July 2024

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, 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 large hydro projects, 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-hydro 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.

Law stated - 1 July 2024

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 Indian government (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.

Law stated - 1 July 2024

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, 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, wind and hybrid power projects.

Earlier, wind projects were awarded based on feed-in tariffs. However, post 2017, competitive bidding route has been adopted for wind projects as well.

The Tariff Policy 2016 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.

Law stated - 1 July 2024

Operational authorisation

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, the majority of such permits are related to and are required until the commissioning of the projects. Thereafter, the projects are required to comply with technical standards prescribed by the CEA in relation to the maintenance of the projects. Further, there are operational level compliance requirements including those under the labour and employment permits that need to be carried out routinely. Further, to prevent dam failure-related disasters, the GoI enacted the Dam Safety Act 2021 for proper surveillance, inspection, operation and maintenance of the specified dams. The Act came into force on 30 December 2021.

Law stated - 1 July 2024

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 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).

Law stated - 1 July 2024

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 Indian government 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 300 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.

Law stated - 1 July 2024

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.

Law stated - 1 July 2024

UPDATE AND TRENDS

Recent developments

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

The Indian government (GoI) has committed to achieving about 50 per cent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030, and to a reduction of the emission intensity by 45 per cent as against 2005 levels by 2030. The Ministry of New and Renewable Energy (MNRE), is also working towards achieving 500GW of installed capacity from non-fossil sources by 2030.

As at 30 April 2023, the total installed capacity of renewable energy projects and large hydro projects stands at 146.65GW and 46.92GW, respectively, and the percentage share of installed capacity of renewable energy (including large hydro energy) stands at 43.52 per cent of the total installed power capacity.

The National Electricity Plan issued by the GoI in May 2023 anticipates that the share of non-fossil-based capacity is likely to increase to around 57.4 per cent by the end of 2026–2027 and may likely increase to around 68.4 per cent by the end of 2031–2032. This estimates an installed capacity of around 600GW by the end of fiscal year 2027 and 900GW by the end of fiscal year 2032.

The GoI has been actively promoting renewable energy sources and has been taking steps to provide an enabling framework for the sector. On 31 March 2023, the MNRE released the bidding trajectory for renewable energy power projects. Pursuant to this, MNRE envisages that bids for renewable energy capacity of 50GW per annum are to be issued every year from fiscal year 2023–2024 to fiscal year 2027–2028.

Further, to boost investment in the electricity sector and specifically in the renewable energy space, the GoI intends to replace conventional energy meters with prepaid smart meters in the next couple of years. The GoI also envisages the privatisation of power departments and power distribution utilities in union territories, with the aim of improving the quality and reliability of power supply and providing better services to consumers.

Recent tenders for firm and dispatchable renewable energy (FDRE) projects have garnered considerable attention. Due to the intermittent nature of renewable energy, integrating energy storage systems with renewable energy projects is essential for providing a continuous, round-the-clock supply of renewable power. To facilitate the procurement of FDRE power by distribution companies from grid-connected renewable energy power projects with energy storage through tariff-based competitive bidding, the Ministry of Power introduced the Guidelines for Tariff-Based Competitive Bidding Process for Procurement of Firm and Dispatchable Power from Grid Connected Renewable Energy Power Projects with Energy Storage Systems. These guidelines have paved the way for procurers to float tenders for the procurement of FDRE. With the clarity on projects and timelines set out in the guidelines, generators are also coming forward to participate in the tenders.

Law stated - 1 July 2024

Recent developments

Describe any notable pending or anticipated legislative proposals.

The MoP has from time to time proposed certain amendments to the Electricity Act 2003 (Electricity Act); however, none of these have proceeded to be passed by the Union Parliament.

The draft Electricity (Amendment) Bill 2022 proposes to permit more than one distribution licensee (discom) to operate in the same area and requires network-owning discoms to provide open and non-discriminatory access to their network to other discoms. It also proposes to provide for a payment security mechanism to ensure timely payment to generation companies. The Electricity (Amendment) Bill 2022 was introduced in parliament in August 2022, but was referred to a parliamentary committee for detailed examination.

Apart from the proposed amendments to the Electricity Act, the GoI plans to develop the Indian carbon market by establishing a national framework for pricing greenhouse gas emissions and the trading of carbon credit certificates. In this regard, the Bureau of Energy Efficiency and the Ministry of Environment, Forest and Climate Change are developing a 'carbon credit trading scheme'.

Law stated - 1 July 2024