THE RENEWABLE ENERGY LAW REVIEW

SECOND EDITION

Editor
Karen B Wong

THE LAWREVIEWS

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PREFACE

I was incredibly honoured to be the editor of the first edition of *The Renewable Energy Law Review* and was delighted to learn of the positive reception for the publication. The second edition has been expanded to include chapters for Germany and Mexico and we look forward to including additional jurisdictions each year as the growth of renewable energy continues globally.

Little did I know, working as a young associate in the 'early days' of renewable energy projects, that, fast-forward to over 30 years later, the industry would be as large and as active as it is today across the globe. As a US-based partner at Milbank practising in the energy industry, I see different political environments, tax and other incentives in place in our 50 states and, having worked on multiple international projects on four different continents, I know that the regimes across the world are equally unique. This compendium has been formulated to provide you with a good overview of the legal framework and current status and challenges in structuring, financing and investing in renewable energy projects in the selected jurisdictions.

Whether you are someone already active in this sector or merely interested in learning more about the policies, legal structures and state of play in the renewable energy industry globally, I hope that this guide will aid you in your efforts as a participant in an industry that is increasing the number of new sources for energy projects with fewer carbon emissions. As a young, naive and idealistic student applying to law school, I had a genuine desire to acquire the necessary skills and tools of a profession that would empower me to change the world. Frankly, I never imagined that I would have a legal career – to date spanning over three decades – that would offer me the opportunity to do just that in my capacity as an attorney facilitating transactions that literally help to keep our skies bluer and our air cleaner globally.

Karen B Wong
Milbank LLP
Los Angeles
July 2019

Chapter 1

AUSTRALIA

Simon Adams and Jo Garland[1]

I INTRODUCTION

Renewable energy projects in Australia range from solar, wind, biomass and hydro to tidal waste to energy, and geothermal. There has been an increasing uptake of hybrid projects, such as solar battery, solar diesel and solar wind projects, to mitigate intermittent renewable generation issues.

Significant renewable projects in Australia are usually developed under an engineering, procurement and construction (EPC) model. An EPC model involves a principal engaging a contractor to design, build and deliver the asset in an operational state. Once commissioning is complete, the project is transferred to either debt or equity investors or the entity taking the electricity generated by the project.

Factors affecting the bankability of a renewable energy project generally include securing an offtaker (i.e., a purchaser of the electricity) or access to the electricity market to sell electricity; procuring access to the electricity network if the project is grid-connected; whether the project involves proven or new technology; the experience and creditworthiness of the parties involved, including the EPC contractor; whether government grants or funding is available; the availability of renewable incentives such as renewable energy certificates; and a stable long-term energy policy.

II THE YEAR IN REVIEW

The past year has seen remarkable growth in the renewable energy industry in Australia. The Clean Energy Council has reported that investment in large-scale clean energy projects doubled to more than A$20 billion in 2018 as 38 projects were completed throughout the year.[2] According to Green Energy Markets, renewable energy represented a 20.9 per cent market share of Australia's main east and west coast grid power supplies over January 2019, achieving a share of 21.3 per cent across the combination of Australia's main east and west coast grids. This was a significant increase from 2017's share of 17 per cent.[3] It appears that this growth pattern is set to continue, with the Green Energy Markets indicating that more

1 Simon Adams is a partner and Jo Garland is a special counsel at HFW.

2 Clean Energy Council, 'Clean Energy Australia Report 2019' <https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2019.pdf>.

3 <http://greenmarkets.com.au/news-events/renewable-energy-index-january-2019>.

than 3000MW (DC) of utility-scale projects will be commissioned in 2019; however, the level of utility-scale solar photovoltaic (PV) installations is expected to fall in 2020 once the mandated Renewable Energy Target (RET) has been met.[4]

The increase in solar penetration and intermittent renewable technologies has heightened concerns about energy security and reliability. This is particularly as a result of the widespread blackouts in South Australia during 2017. Renewable technologies in the form of battery storage have been used as a mechanism to combat reliability issues.[5] The landmark Tesla lithium battery installed in South Australia has already been used successfully to respond to power failures. It was reported that the battery delivered 100MW into the national energy grid in 140 milliseconds following a power plant trip in Victoria.[6] The project has reduced costs associated with stabilising the energy grid by nearly A$40 million.[7]

Other major renewable energy initiatives have been developed over the past year across other states in Australia. In Western Australian, Synergy, Cbus Super and the Dutch Infrastructure Fund established a renewable energy fund known as Bright Energy Investments (BEI). BEI will finance the A$500 million Warradarge Wind Farm, along with the expansion of Greenough River Solar Farm (which was Australia's first large solar project when built) and the refurbishment of the Albany Grasmere Wind Farm.[8]

One of Australia's largest wind farms is the Golden Plains Wind Farm in Victoria, with a development cost of A$1.7 billion. Hybrid renewable projects have also been on the rise, with the Queensland government approving the development of the A$1.5 billion Clarke Creek Wind and Solar Farm project, which includes wind, solar and an energy storage facility.

Pumped hydro is also becoming part of the energy mix, as is evident from the proposed expansion of the Snowy Mountains hydro scheme. The proposed expansion would result in the biggest 'battery' in the southern hemisphere and is another good example of the measures being taken to combat the intermittency of renewable energy sources.[9]

Hydrogen has also the potential to play a pivotal role in the future of renewable energy in Australia. Australia's Chief Scientist, Alan Finkel, recently presented a proposal for a national hydrogen strategy indicating Australia has the capacity to build an export industry worth A$1.7 billion. One of the major drivers for the hydrogen market is expected to be hydrogen-powered fuel cell electric vehicles in densely populated areas. The creation of a Renewable Energy Council in Western Australia is evidence of current opportunities and efforts to transition to a renewable hydrogen future.

4 <http://greenmarkets.com.au/resources/solar-achieves-new-record-of-3775-mw-in-2018-with-2019-set-to-beat-this-aga>.

5 Harmsen, Nick, 'Tesla's big battery a shining light for SA but storms leave neighbours in the dark', ABC New <http://www.abc.net.au/news/2017-12-01/tesla-giant-battery-officially-launched-in-sa/9215318>.

6 Kimmorley, Sarah, '"That's a record": Elon Musk's Tesla battery in South Australia responded in just 140 milliseconds after a coal-fired power plant failed' <https://www.businessinsider.com.au/elon-musks-tesla-battery-south-australia-responded-in-record-time-2017-12>.

7 <https://www.inverse.com/article/51515-tesla-s-battery-has-already-saved-south-australia-a-huge-amount-of-money>.

8 Gifford, Jonathan 'Cbus Super, Dutch Infrastructure Fund to hold 80.1% in Synergy renewable portfolio' <https://www.pv-magazine-australia.com/2018/04/10/cbus-super-dutch-infrastructure-fund-to-hold-80-1-in-synergy-renewable-portfolio/>.

9 In the Black, 'Renewable energy gets set to outsmart coal' <https://www.intheblack.com/articles/2018/03/01/renewable-energy-storage>.

The rapid growth in renewable energy projects in Australia has been attributed to the RET, which is expected to be met before it expires in 2020.[10] It was proposed that the RET be replaced by the National Energy Guarantee (NEG). However, the NEG was abandoned by the federal government in 2018.

The recently re-elected Coalition government has proposed a Climate Solutions Package, which is the central emissions reduction policy and includes measures such as a climate-solutions fund. The Package is reported to cost A$3.5 billion over 15 years. The Coalition has also committed to emissions reductions in line with the Paris targets.

III THE POLICY AND REGULATORY FRAMEWORK

i The policy background

Australia's RET aims to ensure that by 2020 at least 33,000GWh (or 23.5 per cent) of Australia's total electricity is generated from renewable sources. The RET is an Australian federal government policy that has operated since 2001.[11] Various state and territory governments of the Commonwealth of Australia have also implemented their own renewable energy targets.

On 4 April 2019, the Clean Energy Regulator released the 2018 Renewable Energy Target Annual Statement, which confirmed that the Large-scale Renewable Energy Target (LRET) of 33,000GWh will be achieved and is likely to be exceeded by 2020.

The RET is made up of two schemes – the LRET and the Small-scale Renewable Energy Scheme (SRES). The LRET encourages investment in renewable power stations through financial incentives in the form of tradable certificates; the SRES encourages small users to instal small-scale systems. Australian states and territories have also incentivised the uptake of small-scale solar generators by providing feed-in-tariffs.

It is expected that the LRET will deliver the majority of the RET.[12] The price of renewable energy generation is becoming increasingly more cost-effective. Additionally, investment in large-scale solar projects has been assisted by the Australian Renewable Energy Agency (ARENA) and the Clean Energy Finance Corporation, pushing the prices of these projects down to almost half of what they were.[13] For example, in 2015, ARENA committed A$20.90 million in funding for the DeGrussa solar project in Western Australia, which has a total project value of A$39.47 million.[14]

10 Clean Energy Council, 'Reflecting on a record year for renewables' <https://www.cleanenergycouncil.org.au/news/2018/February/reflecting-record-year-renewables.html>.

11 In 2015, the Renewable Energy Target was reviewed and was scaled down from the previously legislated amount of 41,000GWh to the current 33,000GWh.

12 Tomaras, Juli, Parliamentary Library Briefing Book – Key Issues for the 45th Parliament, 'Renewable energy policy: retreat, renewal and revitalisation?', 128 <http://parlinfo.aph.gov.au/parlInfo/download/library/prspub/4787355/upload_binary/4787355.pdf;fileType=application/pdf>. Clean Energy Regulator, 'How the scheme works' <http://www.cleanenergyregulator.gov.au/RET/About-the-Renewable-Energy-Target/How-the-scheme-works>.

13 See footnote 5 above.

14 Australian Government, Australian Renewable Energy Agency, 'DeGrussa Solar Project' <https://arena.gov.au/projects/degrussa-solar-project/>.

The Coalition's recently announced Climate Solutions Package builds on existing policies and success in meeting Australia's Kyoto commitments. The existing Emissions Reductions Fund has received further funding and there is significant funding for the Snowy 2.0 giant pumped hydro battery and energy-efficiency and electric-vehicle strategies.

ii The regulatory framework

Network access and market dynamics

The largest electricity market in Australia is the National Electricity Market (NEM), which operates in all states and territories other than Western Australia and the Northern Territory. The NEM is operated by the Australian Energy Market Operator (AEMO), in accordance with the National Electricity Law and the National Electricity Rules.

The NEM includes a 'gross pool' market for electricity, where all transmission-connected generation is dispatched in each five-minute period based on the results of a security and transmission-constrained auction. The auction sets a marginal price for each five-minute period, it has a price cap of A$14,200/MWh, and is adjusted annually for inflation.[15] Generation facilities can connect to the network in the NEM on a 'constrained-access' basis – that is, the total amount of generation capacity is not restricted to network capacity, but only the cheapest set of generators are dispatched to meet system requirements.

In the NEM, most renewable generators are considered to be 'semi-scheduled'. These facilities can normally generate unconstrained; however, the AEMO can direct them to operate below certain output limits in certain situations (for example, for system security).

In Western Australia, the Wholesale Electricity Market (WEM) is operated by the AEMO in accordance with the Wholesale Electricity Market Rules and WEM market procedures. The WEM is a gross pool electricity market that includes a mechanism to pay for capacity by low electricity price caps, and a hybrid constrained–unconstrained network access model. A constrained network access model is currently being considered by the Western Australian government.[16] The constrained network access model being proposed for the WEM is similar to the model currently used in the NEM.

Western Australia's mechanism to ensure reliability and security of supply, through which scheduled generators and non-scheduled generators (such as wind and solar) can provide capacity when required, is called the Reserve Capacity Mechanism. The Public Utilities Office (PUO) in Western Australia has completed a review on improvements to the Reserve Capacity Mechanism pricing arrangements in the WEM and the suitability of implementing an auction to determine capacity prices and other alternative pricing arrangements. As a result, the PUO has prepared draft amendments to the WEM Rules to incorporate its final recommendations; these changes have yet to be implemented.

15 AEMO, 'Fact Sheet: The National Electricity Market' <https://www.aemo.com.au/-/media/Files/Electricity/NEM/National-Electricity-Market-Fact-Sheet.pdf>.

16 Government of Western Australia, Department of Treasury, 'Industry reforms: Electricity sector reform initiatives' <https://www.treasury.wa.gov.au/Public-Utilities-Office/Industry-Reform/>.

RET

The RET is administered by the Clean Energy Regulator (CER) in accordance with the Renewable Energy (Electricity) Act 2000 (Cth) and the Renewable Energy (Electricity) Regulations 2001 (Cth). The CER is Australia's independent statutory authority, established in 2012 by the Clean Energy Regulator Act 2011 (Cth).

The RET operates as a market for tradable certificates for each megawatt of electricity generated from renewable sources. Tradable certificates are created and issued through the REC Registry, which is administered by the CER. 'Liable entities' (electricity retailers and some large users) must source those certificates from persons that generate power from renewable sources to meet their own renewable energy obligations, and then surrender those certificates to the CER in certain percentages (determined under the Renewable Energy (Electricity) Regulations) to meet annual targets for the RET.

The CER also validates tradable certificates and makes recommendations about tradable certificate requirements.

Approvals for renewable energy projects

There are many regulatory approvals required for renewable energy projects, including planning and environmental approval. The type and timing of approval processes will vary from state to state, depending on the scale and type of project. Applications for funding from ARENA typically take 60 days to negotiate (after an initial expression-of-interest phase) and require the applicant to satisfy the relevant merit criteria to a high standard. Project proponents may also be confronted with environmental-noise and visual-impact assessments.

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

i Project finance transaction structures

Current trends in project financing of renewable energy projects in Australia have seen the emergence of the use of 'project' or 'green energy' bonds. Australia's green bond market has doubled in size since 2015, with the big four domestic banks, and international development banks, being the major issuers of bonds.[17] Going forward, increased diversity of issuers is predicted as local governments and councils have shown interest in these types of bonds.[18] In fact, the Victorian government in 2016 was the first government in Australia to use green bonds.[19] Bonds are seen as an attractive method to finance renewable projects given that they are considerably cheaper than financing or refinancing through traditional project finance.[20]

In terms of bank lending, currently international lenders are very active in the Australian renewables market, as there is an aversion to long maturity loan funding by

17 Oliver Yates, Clean Energy Finance Corporation, 'Australia's budding Green Bond Market' <https://www.cefc.com.au/media/feature-articles/files/australias-budding-green-bond-market.aspx>.

18 ibid.

19 Victoria Government, 'Victorian Green Bonds an Australian and World First' (media release, 20 July 2016) <https://www.premier.vic.gov.au/victorian-green-bonds-an-australian-and-world-first/>.

20 World Business Council for Sustainable Development, 'Pathways to scale finance for renewable energy' (11 November 2016), 13 <https://www.wbcsd.org/Programs/Climate-and-Energy/Climate/Resources/Pathways-to-scale-finance-for-renewable-energy>.

Australian lenders.[21] However, there is some evidence that this trend may be changing with the landmark financing of three large solar farms by Wirsol Energy and Edify Energy in 2017. In this transaction, the Commonwealth Bank of Australia funded a 19-year term loan, the first time a domestic Australian bank has lent to a renewable energy project on such a long-term basis.[22] In common with other transactions of this nature, it used a combination of debt finance in conjunction with a grant from the Australian government's Clean Energy Finance Corporation.[23]

An alternative financing arrangement for renewable projects that is starting to appear is the establishment of 'energy funds'. AGL, and now Synergy, have set up energy funds in partnership with institutional investors. The funds provide the opportunity for investors to finance a portfolio of renewable assets, which diversifies risk and reduces cost. It also reduces the amount of equity that energy providers are required to invest in new projects, as well as assisting the energy providers in meeting their 2020 renewable energy commitments. The arrangement is usually set up so that ownership in the renewable energy certificates generated by the project remains with the energy provider.

Australia also has a market for trading renewable energy certificates between financial institutions, brokers, traders, registered agents and electricity retailers. The highest demand for large-scale certificates comes from electricity retailers who are required to meet Australia's renewable energy target.[24] Small-scale system owners and registered agents also have the option to sell small-scale technology certificates through the clearing house or to the electricity provider.[25]

ii Distributed and residential renewable energy

Australia has the highest penetration of rooftop solar of any country in the world,[26] with New South Wales leading the states with concurrent solar and battery installations. By the end of 2018, cumulative installed capacity for PV systems was at 7,982MW, with more than 2 million installations across the nation. This is an increase from 6,580MW and 1.82 million installations at the same time in 2017, indicating the continued strong growth in solar.[27]

The ownership structure of solar and battery products varies. The Clean Energy Finance Corporation has provided funding for a major retailer to offer power purchase agreements to customers. The arrangement provides that the retailer owns, instals and maintains the systems, giving eligible residential and business customers the opportunity to buy any

21 Edify Energy Pty Limited and WeleeAustralia Pty Ltd, 'Whitsunday Solar Farm –Knowledge Sharing Report – Securing Project Financing' (October 2017), 11 <http://edifyenergy.com/wp/wp-content/uploads/2017/11/ARENA-Knowledge-sharing-report-Securing-project-finance.pdf.>.

22 ibid., 7.

23 ibid.

24 Australian Government, Clean Energy Regulator, 'Renewable Energy Target – Tracking Towards 2020: Encouraging renewable energy in Australia' (30 March 2017), 22 <http://www.cleanenergyregulator.gov.au/About/Accountability-and-reporting/administrative-reports/tracking-towards-2020-encouraging-renewable-energy-in-australia>.

25 ibid., 18.

26 International Energy Agency, 'Renewable Energy: Medium-Term Market Report 2016' (2016), 144 <https://www.iea.org/publications/freepublications/publication/MTRMR2016.pdf>.

27 Australian Energy Council, 'Solar Report January 2019' <https://www.energycouncil.com.au/media/15358/australian-energy-council-solar-report_-january-2019.pdf>.

electricity generated from those systems at a price that is forecast to be lower than the average retail electricity tariff.[28] The benefit of this approach is that residential customers avoid paying the upfront costs of installation while still enjoying a lower cost of energy.

In addition to the customer-ownership model, leasing is an alternative arrangement that is offered in Australia to customers. Solar companies design, instal, own, operate and maintain the solar and battery systems and then lease the systems to the customers. The benefit of this approach to customers is that the monthly lease payments are less than the normal monthly power bill.[29]

Financial institutions have also partnered with the Clean Energy Finance Corporation to provide discounts when financing renewable technologies. For example, Macquarie Leasing currently provides discounted financing for electric vehicles,[30] while Westpac also currently offers its customers a discount on renewable energy solutions. Finance options can be in the form of a finance lease, commercial loan or commercial hire purchase agreement.[31]

iii Blockchain technologies and smart contracts

While not yet commonplace, and with some regulatory hurdles to be overcome, blockchain technologies are emerging in the energy and renewables space. Power Ledger has created a peer-to-peer energy trading application envisaged to be for the benefit of producers and consumers. Its technology aims to enable the sale of surplus renewable energy generated at residential and commercial developments. Power Ledger has most recently partnered with a US-based clean energy company to bring its trading platform to North America.[32] From a finance perspective, Australian banks are beginning to invest in blockchain technologies and the Australian Securities Exchange is exploring the viability of applying distributed ledger technology to current clearing and settlement systems.[33]

The Australian government passed the Anti-Money Laundering and Counter Terrorism Financing Amendment Act 2017 to regulate digital currencies. The purpose of the Act is to ensure that currency exchange platforms are regulated to mitigate against money laundering and terrorism financing risks.[34] However, these regulations only extend to participants who exchange digital currencies for money and would not currently appear to extend to the use of

28 Clean Energy Finance Corporation, 'CEFC makes solar more accessible for households, businesses' (fact sheet, July 2015) <https://www.cefc.com.au/media/107381/cefc-factsheet_origin_lr.pdf>.

29 <https://www.cefc.com.au/media/76495/cefc-factsheet-sunedison_lr.pdf>.

30 Macquarie Group Limited, Macquarie Leasing, 'Energy Efficient Finance', <https://www.macquarie.com/au/business-banking/loans-asset-finance/technology-vehicles-and-equipment/>.

31 Westpac Banking Corporation, 'Westpac supports businesses, CleanTech with energy efficiency financing' <https://www.westpac.com.au/about-westpac/media/media-releases/2016/17-May/>.

32 Power Ledger, 'Power Ledger Partners with Clean Energy Blockchain Network to Bring Distributed Renewable Energy Trading to North America' (press release, 7 February 2018) <https://www.powerledger.io/article/power-ledger-partners-with-clean-energy-blockchain-network-to-bring-distributed-renewable-energy-trading-to-north-america/>.

33 Tranter Wilson, Alice, 'Cracking the code: bringing initial coin offerings and decentralised autonomous organizations within the Australian corporate law framework' (2018), 34(1) *Australian Banking & Finance Law Bulletin*, 14, 15 <http://lexisweb.lexisnexis.com.au/JournalOverview.aspx?id=201834BLB00100002_00005>.

34 Cheung, Ka-Chi, 'Blockchain: enforcement and regulations' (2018), 20(10) Internet Law Bulletin, 178, 180 <http://lexisweb.lexisnexis.com.au/JournalOverview.aspx?id=201820INTLB01000178_00001>.

blockchain technologies limited to trading in renewable energy products. Other regulatory issues with the technology relate to attributing liability in a decentralised network,[35] protection of personal data and privacy issues,[36] as well as data security.[37]

V RENEWABLE ENERGY MANUFACTURING

On a world scale, Australia has a very small renewable energy manufacturing sector.

The manufacture of renewable energy products in Australia is limited to a number of isolated projects and no major renewable energy manufacturing industries exist in the country. Presumably this is due to Australia's relatively high income levels and high energy prices, making manufacturing of such products more suited to other countries with lower input costs.

The majority of Australia's renewable energy 'manufacturing' relates to the development and commercialisation of intellectual property. This is arguably driven by the lack of subsidies available in Australia for renewable energy manufacturing, as well as the Australian government's apparent priority of investing in emerging renewable energy technologies and grants or tax incentives for companies that invest in research and development. For example, the Australian government is responsible for:

a the A$2 billion ARENA, a statutory authority charged with co-investing in projects that improve the competitiveness of renewable energy technologies and increase the supply of renewable energy in Australia; and

b the Commonwealth Scientific and Industrial Research Organisation's 'Low Emissions Technology Roadmap', which identifies the opportunities for Australia to be part of the future global energy supply chain.

Australia, and Western Australia in particular, is experiencing strong demand for its lithium mineral reserves because of the increase in lithium-ion batteries (used in electric vehicles and other large battery storage). Australia has the third-largest lithium resources in the world (approximately 16 per cent);[38] is home to the world's largest and highest-grade spodumene deposit;[39] and produced around half of the world's lithium in 2018.[40] A number of lithium processing plants are currently being built in Western Australia and the Western Australian

35 Tranter Wilson, Alice, 'Cracking the code: bringing initial coin offerings and decentralised autonomous organizations within the Australian corporate law framework' (2018), 34(1) *Australian Banking & Finance Law Bulletin*, 14, 15 <http://lexisweb.lexisnexis.com.au/JournalOverview.aspx?id=201834BLB00100002_00005>.

36 Cheung, Ka-Chi, 'Blockchain: enforcement and regulations' (2018), 20(10) Internet Law Bulletin, 178, 179 <http://lexisweb.lexisnexis.com.au/JournalOverview.aspx?id=201820INTLB01000178_00001>.

37 Tranter Wilson, Alice, 'Cracking the code: bringing initial coin offerings and decentralised autonomous organizations within the Australian corporate law framework' (2018), 34(1) *Australian Banking & Finance Law Bulletin*, 14, 15 <http://lexisweb.lexisnexis.com.au/JournalOverview.aspx?id=201834BLB00100002_00005>.

38 <https://minerals.usgs.gov/minerals/pubs/mcs/2018/mcs2018.pdf>.

39 In Greenbushes, Western Australia, approximately 250km south of Perth <http://www.ga.gov.au/data-pubs/data-and-publications-search/publications/aimr/lithium>.

40 <https://www.australianmining.com.au/news/australia-set-to-move-on-lithium-battery-opportunity/>.

government recently announced a task force to explore the potential for Western Australia to also leverage its significant nickel, cobalt, manganese, graphite and copper resources to expand into more of the battery supply chain.[41]

Australia has free trade agreements with a number of overseas jurisdictions and does not impose any specific tariffs on renewable energy equipment from its trading partners.

VI CONCLUSIONS AND OUTLOOK

We expect that the strong investment in wind and solar projects will continue in the year ahead, although there is uncertainty around the policy framework post-RET, as the NEG is no longer part of the renewable energy conversation. It remains to be seen whether the recently re-elected Coalition government will provide a solid framework on this issue.

We also expect there to be increased investment (including from government-funded organisations) in projects addressing the intermittency caused by renewable generation and demand-profile issues caused by household rooftop solar.

Batteries and electric vehicles are likely to become increasingly more affordable and will play a role in shaping the energy future for consumers.

41 <http://www.jtsi.wa.gov.au/news-media/news-detail/2018/05/24/new-strategy-to-capitalise-on-once-in-a-lifetime-lithium-opportunity>.

Chapter 2

AUSTRIA

Stefan Lampert[1]

I INTRODUCTION

Austria is already close to achieving its 2020 renewable energy target of 34 per cent.[2] In 2016, 33.5 per cent of Austria's final energy consumption came from renewables.[3] The government is aiming for all electricity to come from renewable sources by 2030[4] and for a fully decarbonised energy sector by 2050. The Austrian government shows a clear political commitment to renewable energy, thus opening, or reopening, a huge potential market. To do so, the Austrian government put additional funding into the renewable energy market by way of an amendment of the Green Electricity Act.[5] Therefore, renewable energies are of major importance in Austria. Austria provides a dynamic environment despite the fact that Austrian electricity law is divided between federal and state law. However, among countries in the European Union, Austria leads the pack when it comes to the percentage of electricity it generates from renewable sources.[6]

II THE YEAR IN REVIEW

The latest figures on the Austrian energy industry show that Austria continues to play a pioneering role in the use of renewable energy sources. Above all, the use of biomass, wind, photovoltaics and hydropower is of paramount importance. With the highest share of renewable energies in gross electricity consumption, Austria continues to occupy the top position within the European Union. The share of wind power and photovoltaics increased further between 2005 and 2016, and currently accounts for 4.4 per cent of domestic energy generation.

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1 Stefan Lampert is a senior associate at Wolf Theiss Rechtsanwälte GmbH & Co KG.

2 See https://ec.europa.eu/info/news/vice-president-sefcovic-austria-second-energy-union-tour-2018-feb-27_en; Further: C. Kettner et al., 2010 National Renewable Energy Action Plan for Austria (2010).

3 See Statistics Austria.

4 See Government Programme 2017–2020 (Regierungsprogramm 2017–2020), page 175: 'Klare Zieldefinition für die Steigerung des Anteils von erneuerbaren Energien am nationalen Gesamtverbrauch: 100% (national bilanziell) Strom aus erneuerbaren Energiequellen bis 2030'. At the same time, the government facilitated implementation by bundling relevant competencies within one ministry (Bundesministerium für Nachhaltigkeit und Tourismus).

5 See Metzler, Die 'kleine Ökostromnovelle' – auch eine 'kleine Ausgleichsenergienovelle', ZTR 2017, 174.

6 See https://www.sciencealert.com/austria-s-largest-state-now-gets-100-percent-of-its-electricity-from-renewables.

In May 2018, the Austrian Climate and Energy Strategy[7] was decided by the federal government. The strategy aims to reduce greenhouse gas emissions by 36 per cent by 2030, and to decarbonise energy provision by 2050. This will be reached by increasing the share of renewable energy to 45 to 50 per cent by 2030, from the current level of 33.5 per cent, with a sub-target of fully renewable electricity production by 2030; and by increasing energy efficiency by 30 per cent by 2030 as compared to 2015, with a 1,200PJ limit of total primary energy demand in 2030.[8]

III THE POLICY AND REGULATORY FRAMEWORK

i The policy background

The Austrian electricity market, which was liberalised in 2011, operates within a framework that consists of the relevant legislation at EU, Austrian and provincial level: the decisions handed down by the bodies of the Austrian regulatory authority, E-Control, the Austrian electricity market rules and the market participants' general terms and conditions.[9] The regulatory regime relating to renewable energy has undergone several amendments in recent years. In general, recent legislative actions have addressed the issue of a more efficient allocation of support funds and have aimed at a quicker approximation of green electricity facilities to real market conditions. The regulatory regime is likely to undergo similar amendments in the years ahead. However, there are currently no indications of anticipated fundamental changes to the regulatory regime governing renewable energy in Austria in the near future.

In Austria, a guaranteed feed-in tariff encourages renewable energy project development. As a matter of statutory obligation, the Green Electricity Settlement Centre offtakes the electricity generated in officially recognised electricity facilities using renewable energy sources (RES) on the basis of set feed-in tariffs and in accordance with contractual terms and conditions approved by E-Control,[10] and for the term set in the Green Electricity Act. The task of exercising the functions of the Green Electricity Settlement Centre is conferred by way of a concession issued by the Minister of Science, Research and Economy for the entire Austrian territory. The functions of the Green Electricity Settlement Centre are currently exercised by the joint-stock corporation OeMAG Abwicklungsstelle für Ökostrom AG, owned by grid system operators, banks and industrial corporations. The feed-in tariffs are set by the Minister of Science, Research and Economy in agreement with the Minister of Agriculture, Forestry, Environment and Water Management, and by the Minister of Labour, Social Affairs and Consumer Protection on an annual basis (or more often) by ministerial ordinance. Mandatory contracting at the guaranteed feed-in tariffs is only applicable to RES electricity generated in facilities that have been specifically recognised under the Green Electricity Act. Facilities eligible for official recognition are: (1) power generating facilities that are run exclusively on the basis of RES; (2) specific hybrid plants; and (3) specific mixed combustion plants. The guaranteed feed-in tariffs for RES electricity from recognised facilities depend on the prices at the time of application. The compensation for recognised RES electricity facilities is based on the electricity produced and fed into the public electricity grid system. Furthermore, mandatory contracting only applies if RES electricity generated in a recognised facility and

7 See https://mission2030.info/wp-content/uploads/2018/06/Klima-Energiestrategie.pdf.

8 See https://www.ieabioenergy.com/wp-content/uploads/2018/10/CountryReport2018_Austria_final.pdf.

9 See E-Control, The Austrian Electricity Market.

10 E-Control is a public authority.

fed into the public grid system is provided to the Green Electricity Settlement Centre over a period of at least 12 months. The duration of the general mandatory contracting period and the mandatory statutory obligation to offtake electricity generated in officially recognised RES electricity facilities is generally 13 years, and 15 years for solid and liquid biomass and biogas facilities from the date on which the Green Electricity Settlement Centre offtakes RES electricity. In any case, it ends at the end of the 20th year of operation of the facility. After expiry of the mandatory contracting period, the Green Electricity Settlement Centre is obliged to offer to offtake the electricity from the RES electricity facility operator at market prices for an indefinite period. RES electricity from specific facilities, such as hydropower plants with a peak capacity of more than 10MW, and from animal meal, waste lye and sewage sludge, cannot be made subject to mandatory contracting at the guaranteed feed-in tariffs. In those cases, the Green Electricity Act might under certain circumstances provide for specific investment grants. The guaranteed feed-in tariffs are set by the Minister of Science, Research and Economy in agreement with the Minister of Agriculture, Forestry, Environment and Water Management, and the Minister of Labour, Social Affairs and Consumer Protection on an annual basis (or more often) by ministerial ordinance. These tariffs are essentially based upon the average production costs for cost-efficient, state-of-the-art production facilities. The tariffs shall foster achieving the purposes of the Green Electricity Act, especially with a view towards an efficient use of funds, and should be designed in such a way that the production of RES electricity increases continuously. However, an increase of the production of RES electricity from RES electricity facilities dependent upon sources can be pursued only where the sources are verifiably secured. Note that the applicable legislation and regulations do not provide for any indexation mechanism. Basically, feed-in tariffs are reviewed on a yearly basis and determined for one full year. However, if it is necessary, they may be set for two or more years. The determination of feed-in tariffs for a period of less than one year is also legitimate.

Since 21 December 2018, the new Renewable Energy Directive[11] has been available; this rewrites the previous Directive from 2009 and defines a revised framework for the promotion of renewable energies. This Directive entered into force on 24 December 2018 and must be implemented by Member States by 30 June 2021. It remains to be seen how Austria will implement this Directive in its renewable energy policy.

ii The regulatory framework

The legislative competency in matters of electricity is shared between the federal state, which has competence for enacting the framework legislation in the electricity sector, and the federal provinces of Austria, which are responsible for the implementing legislation.

The federal state has adopted the Federal Electricity Industry and Organisation Act, which contains directly applicable provisions of law and sets out the legislative framework to be further specified by the nine Austrian federal provinces. The federal provinces have enacted provincial electricity statutes in accordance with the framework provisions of the Federal Electricity Industry and Organisation Act. As a consequence of this split of areas of competence, the Austrian legal structure regulating electricity is rather heterogeneous. However, the following acts or ordinances are the principal regulatory acts related to renewable energy in Austria:

11 Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources.

a the Green Electricity Act is the central regulatory act for promoting green energy in the Austrian electricity market;
b the Federal Electricity Industry and Organisation Act,[12] together with the provincial electricity statutes, sets the principal regulatory framework for the generation, transmission, distribution and supply of electricity and for the organisation of the electricity market in Austria;
c the Federal Act on Combined Heat and Power provides a support scheme for the operation and modernisation of existing combined heat and power (CHP) plants;
d the Ministerial Green Electricity Feed-in Tariffs Ordinance 2018 for the offtake of electrical energy from green electricity facilities on the basis of contracts concluded through the Green Electricity Settlement Centre from 1 January 2018 until the end of 2019, enacted jointly by the Minister of Science, Research and Economy, the Minister of Agriculture, Forestry, Environment and Water Management, and the Minister of Labour, Social Affairs and Consumer Protection, sets standardised feed-in tariffs for electricity generated from renewable energy sources;
e with regard to energy efficiency, the Energy Efficiency Act, which is based on EU Directive 2012/27/EU, aims to reach its 20 per cent energy-efficiency target by 2020, increasing security of supply and the share of renewables in the energy mix, and reducing greenhouse gas emissions. These goals are to be achieved through compulsory implementation of energy efficiency measures and related reporting obligations. Parts of the Act entered into force in the summer of 2014, and the remaining parts entered into force on 1 January 2015; and
f the Electric Power Transmission Act, together with provincial electricity statutes, applies if an electricity cable for power current affects two federal provinces.

Notwithstanding the above, the construction of a power plant may be subject to various permits.

The construction of a power plant may be subject to an environmental impact assessment (EIA) permitting procedure under the Federal Environmental Impact Assessment Act (the EIA Act). The types of renewable energy power plants subject to an EIA permitting procedure include:

a wind power projects with a total capacity of at least 30MW or 20 converters each with a nominal output of at least 0.5MW (or, under specific circumstances, wind power projects with a total capacity of at least 15MW, or 10 converters, each with a nominal output of at least 0.5MW). Moreover, since the latest amendment to the EIA Act, wind turbines above an altitude of 1,000 metres with a total electrical output of at least 15MW or with at least 10 converters, each with a nominal output of at least 0.5MW, must also undergo an EIA);
b hydropower plants with a maximum capacity of at least 15MW (or, under specific circumstances, 10MW, or in the case of power plant chains); and
c certain thermal facilities (e.g., combining waste management with power generation).

The EIA procedure constitutes a combined permitting procedure that replaces other applicable regulatory permitting procedures. The procedures of the EIA Act provide for extensive participation by the public.

12 Federal Gazette No. I 110/2010; 'Federal Electricity Act'.

The provincial government of the federal province where the power plant is to be located has competence for the EIA procedure. Under the EIA Act, the provincial government generally must decide upon an application – depending on the type of the particular project – within nine months or six months (e.g., in the case of wind power projects) of the submission of an application. The decision of the provincial government is – as of 1 January 2014 – subject to appeal before the Federal Administrative Court. Taking into consideration the preparation of all relevant documents, the permitting procedure can last up to two years or even more.

If the regulatory regime under the EIA Act does not apply, the power generating facility (in particular hydropower plants) may require the issuance of a water use permit. The water use permit is usually issued by the relevant district authority or, in the case of hydropower plants with a maximum capacity of more than 0.5MW, the relevant provincial governor in accordance with the conditions set out in the Federal Water Act. Moreover, setting up a power generating facility will, in most cases, require a permit under the applicable building laws. Building laws fall within the sole competence of the federal provinces of Austria. Therefore, regulations regarding the construction and operation of a building vary from province to province. In general, a hierarchy of provincial zoning and construction plans determines the sites on which a power plant may be set up. Provincial building laws contain rules regarding the construction of the building and the administrative permitting procedure. The competent construction authority in the permitting procedure is usually the mayor of the relevant municipality. This decision is subject to appeal to the municipal council in most of the federal provinces. In some federal provinces (e.g., Tyrol, Vienna, Upper Austria or Vorarlberg), this decision is subject to appeal to the relevant provincial administrative court. According to the general administrative procedural rules, the authorities have to issue a decision within six months of submission of an application, unless stated otherwise.

Power generating facilities are exempt from the permitting procedure under electricity laws if they serve mainly for the operator's own consumption.[13] Such facilities are subject to the permitting procedure under the Federal Trade Act.

Finally, there is no Austrian legislation requiring the participation in a prior tender procedure to be granted the right (concession) to exploit natural resources. Hence, the Austrian legislation does not foresee the possibility of triggering a public tender by way of an unsolicited proposal. Consequently, no specific act prescribing the award of concessions for the right to exploit natural resources by way of a public tender or the mandatory conclusion of a concession contract with some public entity as legal basis for this right has been enacted.

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

i Project finance transaction structures

In Austria, there is no preferred specific legal form of investment vehicle in the renewable energy sector. As a matter of general business practice, the legal entity operating a green electricity facility will usually be a limited liability company or a joint-stock corporation.

The Green Electricity Act provides for investment allowances granted to the entity constructing or renovating certain hydropower plants and CHP plants.

13 Hauer, EIWOG (2007), 146 et seq. Further VwGH 24 February 2004, 2002/05/0010.

Besides the Green Electricity Act, the Climate and Energy Fund Act is the legal basis for subsidies from the Austrian climate and energy fund granted for projects relating to energy efficiency and sustainability (e.g., for photovoltaic facilities with a peak capacity of up to 5KW).

One observable trend is the 'citizen participation model'. This model essentially refers to cooperation between companies and private individuals in economic projects, and it is a 'sale-and-lease-back' model. This means, for example, that the participants buy one or more photovoltaic panels from a photovoltaic energy company as part of the citizen participation model, and simultaneously lease the panels back to the company. In return for the provision of the photovoltaic panels, the participants receive annual rental income. At the end of the term, the energy company buys back the photovoltaic panels from the participant for a purchase price corresponding to the purchase price paid by the participant for the panels at the outset.

Interestingly, the citizen participation model is also increasingly used by wind power operators.

The investment allowances granted to the constructing (or renovating) entity of certain hydropower plants and CHP plants under the Green Electricity Act amount to a certain percentage of the investment costs in the case of medium-sized hydropower plants and are processed by the Settlement Centre for Investment Allowances.

In addition, the federal provinces may enact individual investment incentive mechanisms within their legislative competence. Such investment incentives usually relate to the construction of photovoltaic and biogas facilities operated on a private level.

ii Distributed and residential renewable energy

As a matter of fact, the already existing Austrian generation structure is characterised by a considerable amount (16 per cent) of distributed generation.[14] In particular, the key players for distributed energy are in the hydropower, wind power and photovoltaic sector. A steady tendency for a significant rise in distributed renewable energy is expected in Austria.

iii Non-project finance development

In Austria, the project finance model is typically used for the purpose of financing the delivery of long-term infrastructure or natural resource projects, including a wide variety of energy types (e.g., wind, solar and hydro) and infrastructure assets (e.g., roads, schools and hospitals).[15] Project finance is the standard form of financing and to date there have been no cases of non-project finance being used for a renewable energy project; neither has crowdfunding been used as a source of finance. In general, structures other than project finance are uncommon in the Austrian renewable energy market.

14 See https://www.e-control.at/sr_publikationen/sr_publikationen-strom/sr_studien/sr_studie_dezentrale_erzeugung_in_sterreich_0;

15 See http://www.brodies.com/sites/default/files/what_is_project_finance_-_handy_guide.pdf.

V RENEWABLE ENERGY MANUFACTURING

Renewable energy as an alternative to fossil-fuel energy is more than simply a catchword for Austrian companies. Austrian companies are aware of their responsibility and invested early in this promising area.[16] There are no special policies or programmes supporting renewable energy manufacturing; however, the Green Electricity Act, the environmental support for companies, and the climate and energy funding pools, as well as the Austrian Research Promotion Agency,[17] may be quoted as prime examples of state subsidy programmes, although not specifically aimed at the manufacturing sector. Furthermore, there are no tariff or trade policies with respect to renewable energy equipment in Austria.

VI CONCLUSIONS AND OUTLOOK

The regulatory regime relating to renewable energy has undergone several amendments in recent years. In general, the recent legislative actions have addressed the issue of a more efficient allocation of support funds and have aimed at a quicker approximation of the green electricity facilities to real market conditions. However, Austria is still an interesting market for investors and project developers because of a guaranteed feed-in tariff that encourages renewable energy project development. Hence, the proportion of renewable energy compared to the gross amount of energy consumption in Austria is exemplary. With a share of 32.2 per cent, Austria lies in third place behind Latvia and Sweden.[18] The fields of hydropower (38.9 per cent), solid biomass (31.5 per cent) and district heating (10.3 per cent) contribute primarily to the total volume of renewable energy.[19]

The European Union has set itself the target of improving the energy efficiency of buildings by 2020 and increasing the use of renewable energy for heating, hot water and air conditioning.[20] The Austrian government goes one step further and is aiming for all electricity to come from renewable sources by 2030, and for a fully decarbonised energy sector by 2050. What is certain is that Austria with its renewable energy strategy will play a major role in the future.

16 See https://www.wko.at/service/aussenwirtschaft/fresh-view-2014-153-sustainable-building.pdf.

17 FFG – https://www.ffg.at/en.

18 See http://www.austria.org/austrianinformation/2015/3/27/sustainable-building-made-in-austria.

19 See https://www.wko.at/service/aussenwirtschaft/fresh-view-2014-153-sustainable-building.pdf.

20 Information from the Commission, COM (2008) 772.

Chapter 3

BRAZIL

Ana Carolina Barretto, Tiago Kümmel Figueiró and Amanda Leal Brasil[1]

I INTRODUCTION

Brazil's power generation already originates predominantly from renewable sources. Hydropower accounts for 60 per cent of the national installed capacity, with a total of 105GW currently in operation.[2] On measuring the actual energy output, the hydroelectric share is even greater: nearly 90 per cent of the electricity consumed in Brazil comes from hydropower sources.

This scenario creates the necessity for diversification of energy sources, since the level of domination currently exerted by hydroelectric plants, unfortunately, also has its shortcomings. Droughts, when combined with the lack of sufficient alternative energy sources, have led to surges in energy spot prices in the recent past, as occurred in 2013 and 2014, when a financial crisis, known as the generation scaling factor dispute, affected all hydro generators and has not been resolved to date.

On top of that, potential hydroelectric sites are becoming scarcer and further away from the consumption market, mostly in the Amazon, where potential environmental impacts, when not preventing the development of new projects altogether, mean plants do not fully benefit from sites' power output capabilities. At present, for instance, large projects being implemented in the region, such as Belo Monte (11,233MW), are being designed as run-of-river plants, which have small reservoirs to limit environmental impact, but on the other hand have a much lower power output than they would have if they had larger dams, and their ability to save water for drier seasons is limited.

Non-hydro renewable sources have become more representative in recent years, with wind corresponding to 11 per cent and solar to 9.7 per cent of the installed capacity currently under construction, while conventional hydropower plants under construction represent 7 per cent.[3] That trend is set to continue in the future.

II THE YEAR IN REVIEW

The Brazilian renewables sector continues to attract new investment at a healthy pace, despite the economic slowdown the country has faced since 2014. One reason for this is, in part, the fact that Brazil is geographically gifted when it comes to renewable sources of energy, and it is a jurisdiction that is very open to foreign investment.

1 Ana Carolina Barretto and Tiago Kümmel Figueiró are partners and Amanda Leal Brasil is an associate at Veirano Advogados.

2 Source: http://www.aneel.gov.br/aplicacoes/capacidadebrasil/OperacaoCapacidadeBrasil.asp.

3 ibid.

The following announcements and transactions illustrate the continued attractiveness of the Brazilian renewable sector:

a Spanish companies Iberdrola and Solatio have announced investments of €10 billion in new generation projects in Brazil;[4]

b after divesting from the distribution business in Brazil through the sale of AES Eletropaulo and AES Sul, AES has expanded heavily into renewables, with the acquisition of wind clusters Alto Sertao 2 (600 million reais) and Alto Sertao 3 (516 million reais) from Renova Energy being the more relevant acquisitions to date;[5]

c following the arrival of State Grid, Three Gorges and SPIC, China General Nuclear Power Group has now landed in Brazil by way of the acquisition of Atlantic Energias Renováveis from English fund Actis;[6]

d international Big Oil companies such as Shell and Equinor have started looking and buying into renewables. Equinor has entered into a joint venture with fellow Norwegian company Scatec Solar for the development of the 162MW Apodi solar cluster and other new solar generation projects;[7] and

e Votorantim Energia and Canadian pension fund CPPIB have formed a joint venture for the acquisition of generation projects, including the recent acquisition of Ventos do Araripe III wind cluster, for 1.8 billion reais.[8]

III THE POLICY AND REGULATORY FRAMEWORK

i The policy background

The Brazilian power sector as a whole (including the renewable power generation industry) has the fundamental characteristic of being centrally planned. Therefore, the government and regulators exert great influence on how the market develops. For example, governmental and regulatory bodies will guide generation expansion by determining what new energy auctions will be carried out and what price caps will apply, and what new transmission facilities shall be put up for tender and constructed (expansion of generation in Brazil relies heavily on *pari passu* expansion of the transmission grid capacity).

In addition to the centralised planning of the power sector, governmental incentives such as subsidised grid tariffs and tax exemptions on energy transactions or equipment (see Section III.ii on incentives, below) are very important, if not crucial, to make renewable sources of power competitive in Brazil.

4 Source: TTR Report at www.ttr.com.

5 Source: https://renewablesnow.com/news/aes-tiete-strikes-deal-to-buy-743-mw-wind-complex-from-renova-plus-pipeline-650132/.

6 Source: https://www.latinfinance.com/daily-briefs/2018/11/8/cgn-moves-to-buy-brazils-atlantic.

7 Source: https://scatecsolar.com/2017/10/04/scatec-solar-and-statoil-to-establish-partnership-in-brazil/.

8 Source: https://observador.pt/2018/02/13/bruxelas-aprova-compra-de-maior-parque-eolico-do-brasil-pela-vtrm-energia/.

ii The regulatory framework

Institutional bodies and agents

The following are the relevant institutions in the Brazilian power sector:

a Ministry for Mines and Energy (MME) – the government body responsible for basic policies and decisions, including setting and definition of basic conditions for new energy auctions and concession bids.

b National Electric Energy Agency (ANEEL) – the independent agency in charge of sector-wide regulation, preparation of new energy auction tender rules and power purchase agreements (PPAs), definition of grid tariffs, overseeing of concession agreements and generation authorisations, enforcement of regulatory compliance and imposition of penalties and other disciplinary actions.

c National System Operator (ONS) – the independent system operator responsible for the operation and management of the national grid (save for some regions in the Amazon, Brazil is nationally interconnected) and for the enactment and enforcement of the grid procedures, including assessing interconnection feasibility of power generation projects.

d Electric Energy Commercialisation Chamber (CCEE) – the power market is organised by CCEE, which acts as the administrator of both the new energy auctions and the spot market (and, like ONS, it is a private entity formed and governed by power sector companies and regulated by ANEEL). CCEE measures aggregated consumption and generation on a real-time basis, keeps the market accounts and settles the spot market transactions.

e Energy Research Company (EPE) – a state-owned company attached to MME responsible for the definition of transmission and generation expansion plans, and the definition and setting of technical requirements to be met by projects to qualify for new energy auctions.

Permitting and development road map

Power generation authorisation

While hydroelectric power generation with capacity over 50MW, transmission and distribution activities are subject to concession agreements,[9] hydropower generation under 50MW (small hydroelectric plants (PCHs)) and non-hydropower generation of any installed capacity (including solar, wind, gas, biomass and thermal sources in general) are subject to authorisations.[10]

Concessions are more heavily regulated than authorisations and assets as a matter of course revert to the government at the end of the concession.[11] Concessions and authorisations may have terms of up to 30 years, and are renewable at the government's discretion.[12]

The regulatory playing field for renewable energy generators is stable and there have been no significant changes to the fundamentals of the industry in the recent past.

9 Law No. 9,074/1995, Article 5.

10 Law No. 9,427/1996, Article 26(vi).

11 Law No. 8,987/1995, Article 18(xi).

12 Law No. 9,074/1995, Article 4, Paragraph 4.

For projects selling power in new energy auctions, the power generation authorisation is granted by MME, while ANEEL is the entity that grants authorisations for projects developed to operate in the free energy market (the structure of the power market is discussed further below).

Environmental licences

Brazil has strict environmental legislation, making the development of a generation project subject to a threefold licensing process:[13] from greenfield to commercial operation, a project must apply and fulfil the applicable requirements for the issuance of (1) a provisional licence, which will allow the entrepreneur to continue the development of the project and demonstrate, when required (in power auctions, for instance), that the project is viable from an environmental standpoint;(2) an installation licence, which will authorise the construction of the generation project; and (3) an operational licence authorising the commercial operation of the power plant.

Other permits

Depending on the characteristics of the project and the location, other permits may be required, such as airspace permits (if the project is located inside or near areas where air traffic safety is a concern), mining blockages (if the project is within the boundaries of an area of mining rights held by third parties) and designations of public utility, to enforce the creation of rights-of-way for transmission lines (where the project company is unable to agree amicable terms with neighbouring landowners).

Energy markets

Power commercialisation in Brazil is structured into two main market environments: a regulated environment and a free-market environment.[14]

The power market as a whole is organised by CCEE. Energy prices are defined under free-market conditions: in the regulated market, generators sell their power at auction to distributors for the prices they find suitable; and, in the free market, generators will enter into freely negotiated agreements. Only distribution and transmission tariffs are fixed by ANEEL.

Prices in PPAs are, in general, subject to annual adjustments for inflation. Auction PPAs include conditions allowing prices to be reviewed should new taxation or legislation impact energy prices. Parties are free to negotiate conditions for the revision of prices in free market PPAs.

Regulated PPAs

The regulated market is based on power auctions where, as a rule, greenfield generation projects sell power for future delivery (new energy auctions, known as A-3 and A-5 auctions respectively, are carried out three or five years ahead of the date that delivery of energy is supposed to commence), by way of PPAs with terms ranging from 15 to 25 years, resulting from auctions jointly conducted by ANEEL, EPE and CCEE. The government may also, at its discretion, call auctions for generators that are already operating (non-greenfield).

13 Resolutions Conama No. 1/1986 and 237/1997.

14 Decree No. 5,163/2004, Article 1.

In the regulated environment, energy is purchased either by a pool of distributors or, when the auction is for 'reserve-energy' agreements, by CCEE. The auctions group generators together on the selling side, competing against each other on price to sell their energy to the pool of distributors. Distributors are, by law, allowed to purchase energy solely in the regulated environment, except for 10 per cent of their energy demand, which can be purchased in the free market from distributed generation plants (small generators connected to the distributors' own grid).

The amount of power needed by the pool of distributors remains secret until the end of the auction. The bids shall be no higher than a ceiling price defined by MME. The bid, from a generator, takes the form of the power output capacity submitted by the generator for the purposes of enrolment in the auction process together with the price at which that power is offered by the generator (but selection is based on price alone). It is immaterial whether a certain amount of power is supplied by two big projects or by 20 smaller projects.

To be eligible to participate in a regulated market auction, a generation project must be subject to a technical qualification process beforehand, which is carried out by EPE. Ordinance No. 21/2008, from MME, stipulates the following requirements for technical qualification of a generation project:

a registration of the project with ANEEL: this registration has the purpose of informing ANEEL that the entrepreneur is developing a power generation project and authorising the entrepreneur to take all measures needed before third parties, such as filing for environmental licences, access opinions, etc.;

b the expected schedule of construction works, including deadlines for the issuance of the relevant environmental licences, connection to grid, tests on completion and commercial operation of the power plant;

c a descriptive memorandum containing a comprehensive technical, economic and environmental description of the project;

d the project budget;

e documentation proving the entrepreneur has secured rights to the land for the construction and operation of the project (except for PCHs, which are entitled to the expropriation of lands for the reservoir and the power plant);

f certification of wind measurements and of estimated annual energy output of wind projects, issued by an independent certifying entity;

g the access opinion;

h water permits, for PCHs and thermoelectric plants;

i the environmental licences applicable to the project;

j the environmental studies produced for the environmental licence application;

k for thermoelectric plants (such as biomass and biogas), evidence of the plant's ability to store sufficient combustibles for continuous operation at nominal capacity;

l for PCHs, the basic design of the plant or the plant upgrade or refurbishment project approved by ANEEL;

m for solar projects, the certification of the solarimetric data, issued by an independent certifying entity; and

n for wind projects, a statement that the turbines to be deployed shall be new.

Once a project has been declared technically qualified by EPE, it will be allowed to participate in the regulated market auctions. An entity participating in the auctions must meet certain legal, tax and financial requirements set out in the applicable auction's public request for

proposals, such as a minimum net worth corresponding to 10 per cent of the project's budget and the requirement to present a bid bond in an amount corresponding to 2.5 per cent of the total investment required for the project (if successful in the auction, a performance bond corresponding to 10 per cent of this amount must be delivered to replace the bid bond).

If a project is successful in selling energy in the auction, MME will issue a generation authorisation and construction must start. If an entrepreneur manages to finish a project ahead of the date on which energy supply is supposed to start, it can sell the energy generated before that date in the free market.

If the construction of a project is not concluded on time, the generator must purchase power in the free market to fulfil its obligations under the PPA. In that case, however, the generator will receive payments calculated in accordance with whichever of the following prices is lower: (1) the PPA price (or 85 per cent thereof if delivery is delayed for more than three months); (2) a combination of the average energy spot price and a spread calculated pursuant to ANEEL's regulations; or (3) the actual price set out in the free market agreement concluded by the generator.[15]

Free market

Generators, commercialisation agents and free consumers can trade power in the free-market environment, under freedom-of-contract conditions. The free market represents nearly 30 per cent of the total amount of commercialised energy in Brazil.

Free-market PPAs do not require prior approval from ANEEL or MME, nor to be registered with any of those authorities. Parties to the PPA must, however, provide information concerning amounts of energy and period of supply in CCEE's electronic system, in time for the agreement to be used to settle the energy market. Both CCEE and ANEEL have the authority to request copies of PPAs for inspection purposes.

In contrast to auction PPAs, free-market agreements tend to be for the short to mid term, and free-market PPAs with terms longer than five years are relatively rare. Because of the absence of a secure long-term revenue stream for free-market PPAs, it is more difficult to structure project finance financing mechanisms than it is for projects selling energy via auction PPAs, which have a guaranteed long-term revenue stream.

Free consumers are qualified as follows:

a special free consumers: consumers with a contracted load of 0.5MW, if they can purchase power from renewable sources only; and

b free consumers: consumers with a contracted load of 3MW (MME recently issued an ordinance reducing the load requirement to 2.5MW as of 1 July 2019 and to 2MW as of 1 January 2020).[16]

Incentives

Special new energy auctions

As mentioned above, MME and ANEEL may conduct energy auctions specifically for renewable generation or alternative sources, creating demand for long-term PPAs (20–25 years) for renewable projects. Historically, at least one auction for renewables has been carried out each year.

15 Resolution ANEEL No. 595/2013.

16 Ordinance MME No. 514/2018.

At the beginning of the development of non-hydro renewables in Brazil, special auctions were required specifically for those sources because they could not compete with conventional energy sources. However, as the market has evolved, wind and solar have become competitive sources of power and have started to compete against conventional energy in energy auctions.

For 2019, two auctions are planned for wind, solar, hydroelectric and thermoelectric sources: A-6 and A-4 auctions.

Subsidised grid tariffs

Generators of renewable sources (hydro, biomass, biogas, wind, solar and qualified cogeneration) injecting up to 300MW of power into the grid, as well as consumers purchasing power from those generators, are entitled to a 50 per cent discount on grid use tariffs.[17] This incentive plays a big role in fostering investments in renewables in Brazil and has helped to create a big share for 'incentivised energy' in the Brazilian energy free market.

This incentive does not apply to distributed generation.

ICMS and PIS/COFINS exemption on distributed generation output

The amount of power supplied by distribution companies to consumers corresponding to the amount of power injected into the grid by distributed generation projects is exempt from ICMS (a Brazilian tax similar to VAT). The exemption was allowed by CONFAZ ICMS Agreement No. 16/2015 and replicated by the legislation of most states. ICMS is a state tax and rates normally vary between 12 per cent and 20 per cent depending on the state and type of consumer.[18]

Likewise, the amount of power is exempt from the PIS/COFINS federal taxes. The PIS/COFINS rate is 9.25 per cent.

If it were not for the exemptions, the taxes would apply to the invoices issued by power distribution companies to consumers using the distributed generation net metering scheme.

ICMS exemption on equipment

Pursuant to CONFAZ ICMS Agreement No. 101/97, as amended, equipment for wind and photovoltaic power generation is ICMS exempt.

Some photovoltaic equipment, such as inverters and trackers, however, has not been covered by the exemption.

Tax reduction for infrastructure development

Under Law No. 11,488/2007, renewable power generation projects are entitled to PIS/COFINS exemption on equipment, materials and services to be accounted as fixed assets of the project.

To become entitled to tax reduction for infrastructure development (known as REIDI), the project must have received a power generation authorisation and have applied to be qualified as a priority project, which is normally granted by ANEEL.

17 Law No. 9,427/1996, Article 26, Paragraph 1.

18 State tax benefits must be allowed by CONFAZ agreements (CONFAZ is Brazil's National Council of Finance Policy). This is a measure designed to avoid Brazilian states competing against each other by granting tax incentives.

Incentivised project bonds

Projects declared a priority by ANEEL (see above) are also entitled to issue incentivised project bonds (also known as green debentures).

Law No. 12,431/2011 governs incentivised project bonds. Individuals holding these bonds are exempt from income tax, and legal entity bondholders pay income tax at a 15 per cent rate. The bonds must have a maturity of at least four years and pay interest at intervals no longer than 180 days.

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

i Project finance transaction structures

Because of the complexity of renewable energy projects, their high structuring costs and long implementation periods, project finance is the preferred funding mechanism in Brazil. Most renewable energy projects are currently being developed in the context of energy auctions where regulated PPAs represent the main source of revenues. In light of that, the ability to secure long-term contracts that offer predictable cash flows makes renewable energy projects especially well-suited to project financing.

Diverse loan structures are commonly used for project finance in Brazil (some of them very similar to international practice, such as direct loans and syndicated loans, with administrative and security agents, intercreditor agreements and guarantee sharing agreements), including limited-recourse loans (i.e., loans secured by the project assets and paid entirely from the project cash flow), rather than from the general assets or creditworthiness of the project sponsors.

The ownership structures commonly used in Brazilian project financings for renewable energy projects usually involves equity investors (known as sponsors) and debt providers that advance loans to the project company, a special purpose vehicle incorporated for the exclusive purpose of owning and exploiting a certain project. BNDES, the Brazilian state-owned development bank, has always played a major role in the financing of large projects. In addition to BNDES, Banco do Nordeste do Brasil,[19] state-owned banks and funds such as Banco do Brasil, Caixa Econômica Federal and FI-FGTS,[20] as well as some Brazilian and international commercial and investment banks, have also been very active in the financing of projects in Brazil.

BNDES has already announced new financing strategies for the coming years, including the adoption of interest rates more in line with market standards. The main objective in doing that is to gradually reduce BNDES' role as the main provider of long-term financing for projects in Brazil, allowing commercial banks (national and foreign) and capital markets to step in. BNDES would hence over time assume a more supplementary role, acting as a catalyst to mobilise other sources of funds, much like international development banks are seen to do in other countries.

Indeed, project bonds are becoming increasingly popular in Brazil as a financing mechanism and, when issued in connection with the financing of power projects, they may benefit from tax incentives (see Section III.ii, above). The 'incentivised debentures' market has seen significant development in Brazil in recent years, especially for the renewables

19 BNB, a development bank for the Brazilian north-east.

20 An investment fund of the employees severance indemnity fund, FGTS.

industry. Since 2012, the issuance of incentivised debentures amounted to approximately 56.7 billion reais, consisting in 216 public offer transactions (with 165 of these related to the energy sector), with an average debt term of nine years.[21]

ii Distributed and residential renewable energy

Since May, 2012, Brazil has implemented the regulatory framework for the operation of mini (up to 75kW) and micro (between 76kW and 5000kW) distributed generation from solar, wind, hydro, biomass or qualified cogeneration sources, along with a net metering scheme allowing end users to inject power into the grid and offset energy bill costs.[22]

Following a slow start, and a revision of the legislation,[23] the distributed generation market has grown exponentially. Brazil now has 79,022 distributed generation projects – comprising 78,125 solar, 157 thermoelectric, 83 mini hydro and 57 wind power projects, and 109,545 consumers making use of the distributed generation net metering scheme.[24]

In contrast, for commercial-scale distributed generation projects with installed capacity of between 0.5MW and 5MW and that would be developed and delivered by energy companies such as Sowitec, Enel, etc. and sold or leased to a large consumer or group of consumers, the figures are not as impressive: 125 projects with an aggregate capacity of 167.5MW – comprising 59 mini hydro, 49 solar, 15 thermoelectric and 2 wind power projects, with the power being consumed by 12,152 consumers.[25]

One factor that may have hindered the development of larger-scale projects is the fact that the regulatory framework for distributed generation is due for review by 31 December 2019 (see Section VI, below).

iii Non-project finance development

Renewable energy projects also attract private equity firms, pension funds, investment funds, insurance companies and family offices seeking higher yields, and these provide much-welcomed funding alternatives for the industry. The above-mentioned investments in Brazil by CPPIB are a good example of that trend.

Another notable trend is the reinvestment of merger and acquisition proceeds by existing participants in new projects. Italian group Enel recently sold to the Chinese entity CGN Energy International Holdings 540MW of solar wind power projects located at Piauí and Bahia states in Brazil, for a total of 2.9 billion reais. This sale represented the Chinese group's entry and start of operations in Brazil, and for Enel, in turn, the continuity of investments, development and implementation of an extensive pipeline of renewables projects in Brazil. According to Enel, the strategy for the group for the next three years consists in maximisation and acceleration of the creation of value in renewable assets by means of the sale of such assets and the release of relevant amounts of capital to be reinvested in new renewables projects.[26]

21 Information bulletin on incentivised debentures, published by the Brazilian Ministry of Economy, dated April 2019 (available at http://www.fazenda.gov.br/centrais-de-conteudos/publicacoes/boletim-de-debentures-incentivadas/arquivos/2019/boletim-de-debentures-abril-2019).

22 Resolution ANEEL No. 482/2012.

23 Resolution ANEEL No. 687/2015.

24 Source: ANEEL Generation Database.

25 ibid.

26 Source: https://forbes.uol.com.br/last/2019/01/enel-vende-usinas-de-energia-renovavel-por-r-29-bi/.

V RENEWABLE ENERGY MANUFACTURING

Brazil has a long-established chain of supply for conventional (hydro and thermoelectric) renewable sources, with the presence of suppliers of all sizes, both domestic and international.

Mainly because of national content requirements under the PROINFA renewables incentive programme (which helped to start the wind power industry in Brazil in 2004) and the BNDES financing programme, a complete chain of supply for wind power projects has been developed in Brazil. Enercon (known as Wobben in Brazil), Siemens Gamesa and General Electric were the first companies to set up manufacturing facilities, followed by Vestas and Suzlon, among others. In addition to the major turbine manufacturers, Brazil has a myriad of suppliers of components, including for towers, blades and cast metal parts.

For photovoltaic equipment, there is a similar trend, with significant manufacturers such as BYD and Canadian Solar having established local facilities.

VI CONCLUSIONS AND OUTLOOK

As regards the volumes contracted solely through regulated auctions, 3.7GW of additional solar generation capacity is due to be constructed and start operation by 2022[27] and 5.2GW of additional wind capacity shall be operational by 2023,[28] creating substantial demand for equipment, financing and services.

A point to note is a proposal from the government to replace subsidies on grid use tariffs with a new environmental attributes market. According to a working paper put out to public consultation in 2017, subsidies on grid tariffs should be granted only to renewable generation projects that obtain power generation authorisations until 31 December 2020. As of 1 January 2021, a new market in environmental attributes should start and provide new streams of revenues. That leaves a big question mark hanging over the ability of the Brazilian renewables sector to continue its successful expansion trajectory, since grid tariff subsidies played a key role in that success. The plan has still to be discussed by the National Congress and, given that other matters on the agenda are seen as more important (social security and pension reforms, mainly), there is no clarity at the moment on whether the proposal will become law in the short or medium term.

No further developments on the modification of grid tariff subsidies has occurred since the public consultation, but the new administration created a working group on 4 April 2019 to evaluate and propose a regulatory reform with two main purposes:

a to ensure that the metrics and mechanisms currently in use are adapted to expand the power sector to meet the ever increasing demand for energy in Brazil at an adequate pace to assure supply; and

b to adjust the 'architecture of economic signals' for new investments and better allocation of resources, to improve economic efficiency.

The new regulatory reform is expected to consider such matters as (1) expansion of the free market, (2) bankability of the power sector (beyond subsidised development bank financing),

27 Source: ABSolar, http://www.absolar.org.br/infografico-absolar-.html.

28 Source: ABEEolica, http://abeeolica.org.br/wp-content/uploads/2019/05/Infovento11_ENG.pdf.

(3) introduction of new technologies (energy storage, reversible hydroelectric plants, hybrid plants, etc.), (4) better coordination of the expansion of transmission in relation to generation systems, (5) distributed energy resources and (6) decommissioning and retrofitting plants.

In respect of distributed generation, the most widely discussed matter is the scope of the net metering arrangement for distributed generation, which is expected to be addressed by the prospective regulatory revision due by 31 December 2019 (see Section IV.ii). Currently, consumers generating energy off site are entitled to use the power delivered into the distribution grid to offset both energy and grid tariffs, despite using the grid for purposes of energy consumption. This has been viewed as a crossed subsidy (i.e., paid for by consumers that do not necessarily benefit from this arrangement), since the tariffs that power distribution companies charge all their clients are increased to make up for losses of revenue due to the net metering mechanism.

The market's expectation is that net metering will be reduced solely to offset energy tariffs, and not grid tariffs, after 31 December 2019. Since grid tariffs are the main component in energy supply costs, the economic gains from the use of distributed generation will be substantially reduced if only energy tariffs are allowed to be offset.

The market also expects that ANEEL will only apply the new rules for projects that interconnect after 31 December 2019, but this will not be confirmed until the new rules are published.

Chapter 4

CHINA

Alex Haichun Lu[1]

I INTRODUCTION

Given climate-change trends and increasing public concern about environmental protection, renewable energy has become a crucial strategic emerging industry worldwide. More and more countries are trying to develop renewable energy-related technologies, and promoting their application. China – with its enormous domestic market, its capability in the manufacturing sector and the determination of the country's leadership to tackle pollution – is no exception. It has become not only one of the most important manufacturing bases for the renewable energy industry, but also the world's largest market for the sector.

It has been more than a decade since the promulgation in 2005 of the Renewable Energy Law (as amended in 2009 (the Renewable Energy Law)), which marked the beginning and laid down the general principles of Chinese legislation on renewable energy. Following promulgation of the Renewable Energy Law, the Chinese authorities, mainly the National Development and Reform Commission (NDRC), the National Energy Administration (NEA) and the Ministry of Finance (MOF), have taken over the administration and policymaking for renewable energy and have since circulated numerous detailed rules, regulations and policies for solar, wind, hydro, biomass, etc. Different categories of renewable energy will therefore be subject to different rules in terms of the formalities relating to project approval, construction, environmental protection, subsidy eligibility, etc. In addition, the various state-owned national grid companies have also been playing an important role in the development and promotion of renewable energy. The grid companies are not policymakers but are largely responsible for the industry's logistics, such as building transmission lines, formulating grid connection standards, inspecting substations, and calculating and paying tariff and subsidies.

Looking at the entire renewable energy sector, solar and wind are centre stage at present. For solar projects, the NEA issued the Provisional Rules on Project Management of PV Power Plants on 29 August 2013, which stipulated that the NEA will hand out an annual quota to each province every year to control the development of photovoltaic (PV) power plants and only those covered in the annual quota will be eligible to receive a subsidy from the National Tariff Premium Subsidy Fund for Renewable Energy. With the promulgation of these Provisional Rules, the development of PV power plants is no longer unrestrained. Developers must first compete for an annual quota before they start developing, and often this competition means a reduction of the feed-in tariff (FIT) for a particular project. Furthermore, on 9 October 2014, the NEA issued the Notice on Further Strengthening the

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Management on Construction and Operation of PV Power Plants, which stressed that it is forbidden to sell a project's filing documents or otherwise dispose of equity in PV power plants; should there be a material change as to the investors of a PV power plant, the project has to go through the filing formalities all over again, otherwise the project will be at risk of losing eligibility to receive the state subsidy. For this reason, developers will not usually transfer equity in a PV power plant until the plant has been commissioned, so not to be regarded as selling the project filing documents. Nevertheless, there have been cases where the developer indirectly transfers the equity in a PV power plant before it has been commissioned by structuring a deal in which the purchaser, instead of directly acquiring the equity in the plant, acquires the plant's intermediate shareholder.

As regards wind power, the NEA issued the Provisional Rules on Development and Construction of Wind Power Projects on 25 August 2011, setting out the framework and principles on the development of wind power projects in China, such as the requirements and formalities for construction and zoning, feasibility studies, project approvals, and completion inspections and acceptance. For offshore wind power projects, the NEA and the State Oceanic Administration (SOA) jointly issued the Rules on Development of Offshore Wind Power on 22 January 2010 (updated on 29 December 2016). On 6 July 2011, the NEA and the SOA further promulgated the Detailed Implementation Rules on the Administration of the Development of Offshore Wind Power. The three above-mentioned sets of regulations constitute the core legislation for the development of onshore and offshore wind power projects.

As in other countries in the world, in China the development of renewable energy is highly dependent on the subsidies from the government. With installed capacity increasing rapidly each year, collecting enough funds to cover such a huge amount of subsidy is becoming an unbearable burden for the government and, in fact, because of lack of funds it has already been delaying the payment of subsidies for eligible renewable energy projects commissioned in recent years. In practice, it is very common for a project not to receive any subsidy until three or four years after being commissioned. To alleviate this financial burden, the Chinese government has been lowering the levels of subsidy each year. With the rapid decrease in the cost of developing renewable energy projects, it is very clear that the level of the renewable energy subsidy will continue to decline in future, and eventually the Chinese government may do away with the subsidy once and for all.

II THE YEAR IN REVIEW

According to the figures released by the NEA on 28 January 2019, the total installed capacity of renewable energy power generation reached 728GW by the end of 2018, an increase of 12 per cent from the previous year; of this total, hydropower installed capacity is 352GW, up by 2.5 per cent; wind power is 184GW, up by 12.4 per cent; solar power is 174GW, up by 34 per cent; and biomass power is 17.81GW, up by 20.7 per cent. The total installed capacity of renewable energy power generation accounted for 38.3 per cent of all installed capacity for electricity generation in 2018, up by 1.7 per cent. These figures show quite astonishing rates of growth, with solar and wind power both growing by double-digit figures, with solar installed capacity in particular growing by a staggering 34 per cent.

To curb the irrational increase in solar investment, on 31 May 2018, the NEA, the NDRC and the MOF unexpectedly jointly issued the Notice on Matters Relating to PV Projects in 2018 (the 5·31 Policy), which stipulated, among other things, that (1) no quota

for building PV power plants would be handed out in 2018 and, until further notice, local governments would not approve the development of new PV power plants requiring subsidy from the state; (2) distributed PV systems would again be put under quota management, with the quota for 2018 set at only 10GW, and to compete for this quota distributed PV systems had to be commissioned before 31 May 2018 (i.e., the date of issue of the 5·31 Policy, leaving no buffer period), otherwise they would not be eligible for a subsidy from the National Tariff Premium Subsidy Fund for Renewable Energy; and (3) the subsidy was to be further decreased by 0.05 yuan/kWh, which was the second time the subsidy had been lowered in 2018 – which was unprecedented. The circulation of the 5·31 Policy was a bolt from the blue and raised wide concerns and worries among both solar power project investors and manufacturers of PV modules, as it dramatically and suddenly froze the market.

On 18 May 2018, the NEA circulated the Notice on Requirements Relating to Wind Power Development in 2018, which stipulated, among other things, that all wind power projects (excluding distributed wind power projects), onshore and offshore, must compete for quota through a bidding and tendering process, with effect from the date of the Notice.

On 16 July 2018, the NEA and NDRC jointly issued the Notice on Promoting the Electricity Trading Market and Further Improving the Trading Mechanism. This Notice does not contain detailed rules or regulations, but rather general declarations on the government's position on promoting trading of electricity generated by distributed generation systems, and calling for various local governments to remove regional barriers to trading, as well as covering other matters relating to the creation of a trading market. This Notice partially echoes the Notice on the Pilot Scheme for Promoting the Trading Market of Distributed Power Generation issued by the NEA and NDRC on 31 October 2017 (the Wheeling Policy), which stipulated that electricity generated by distributed solar systems (e.g., rooftop solar) may be sold to nearby users using grid company transmission lines). According to the Wheeling Policy, only two categories of distributed solar system are eligible for wheeling: (1) systems with installed capacity of less than 20MW and a connection voltage no higher than 35KV; and (2) systems with installed capacity of between 20MW and 50MW and a connection voltage no higher than 110KV. If the distributed solar project chooses to sell its electricity through wheeling, the state subsidy it originally qualified for will be decreased by at least 10 to 20 per cent, depending on the project's installed capacity and connection voltage. The calculation of wheeling charges varies from province to province. There is no doubt that the Wheeling Policy promulgated at the end of 2017 greatly supports the sale of electricity by distributed solar projects, and opens the door for renewable energy investors to trade clean energy through the market, rather than relying solely on the government subsidy to make a profit.

According to the figures released by the NEA, the installed capacity of both solar and wind projects increased significantly in 2018. Notably, offshore wind has also enjoyed a remarkable increase. According to the data released by the Global Wind Energy Council (GWEC), the wind energy industry installed 51.3GW of new capacity worldwide in 2018, of which China installed 1.8GW, more than any other country, followed by the United Kingdom with 1.3GW and Germany with 0.9GW. Since its launch in 2017, the installed capacity of China's offshore wind power has continued to expand. According to China's 13th Wind Energy Development Five-Year Plan, the construction scale of offshore wind power will reach 10GW by 2020, and the aggregate grid-connection capacity will be more than 5GW.

Wind power is considered by many to be the most competitive source of renewable power. China's 13th Five-Year Plan raised the 2020 wind target to 250GW, and aims to shift

focus from the scale of expansion towards quality and efficiency. However, despite China's achievements in wind development, the sector faces many problems, such as its increasing inability to accommodate the rapid surge in the number of wind turbines in remote areas because of underdeveloped grid networks.

There has been a notable phenomenon of offshore funds with big-name limited partners (LPs) interested in acquiring solar and wind projects in China. Experience suggests that these LPs care particularly about the 'environmental attributes' of these renewable energy projects (e.g., green certificates, carbon credits). This is largely because of the commitment to sustainability by some world-leading multinationals, such as Google and Microsoft, and the transitioning of their energy consumption from traditional power to clean energy, hence they have been making tremendous investments in the renewable energy industry.

III THE POLICY AND REGULATORY FRAMEWORK

i The policy background

It is fair to say that the renewable energy industry would not be what it is today without government support. To incentivise the development of renewable energy, the Chinese government mainly offers tax and fiscal incentives to renewable energy developers. The MOF and the State Taxation Administration (STA) jointly issued the Notice on Matters Relating to Corporate Income Tax Preferential Treatment for Enterprises Engaging in Development of Infrastructure on 23 September 2008. According to this Notice, enterprises that engage in the development of infrastructure listed in the Notice will be exempt from paying corporate income tax for three years commencing from the first year that they generate business revenue, and their corporate income tax will be decreased by 50 per cent in the fourth to sixth years.

On 1 March 2012, the MOF, the NDRC and NEA jointly issued the Provisional Rules on the Tariff Premium Subsidy Fund for Renewable Energy. The Provisional Rules stipulate that renewable energy projects such as wind, biomass, solar and geothermal power may apply to be entered into the Catalogue for Tariff Premium Subsidy Fund for Renewable Energy. After being entered into the Catalogue, the renewable energy project may then receive subsidies from the state.

On 25 July 2016, the MOF and STA jointly issued the Notice on Continuing the VAT Policy for Solar Power Projects, which provided that taxpayers selling electric power products they had manufactured through making use of solar power would be subject to a rate of VAT reduced by 50 per cent. This tax policy was valid from 1 January 2016 until 31 December 2018. At present, this tax incentive policy has not been renewed or replaced by a new policy.

In addition to fiscal and tax incentives, a discussion of the FIT policy applicable to renewable energy projects is also relevant. In most cases, renewable energy projects enjoy the benefit of a FIT (i.e., the tariff for a particular renewable energy project will be fixed when it is approved by the local NDRC, and it will be clearly stated in the NDRC approval). The FIT consists of two parts: (1) the sum equal to the local tariff for desulphurised coal-fired power; and (2) the difference between the NDRC-approved FIT and the local tariff for desulphurised coal-fired power. The sum equal to the local tariff for desulphurised coal-fired power will be paid directly by the local grid company according to meter readings; the difference between the NDRC-approved FIT and the local tariff for desulphurised coal-fired power will be covered by the central government (i.e., the Tariff Premium Subsidy Fund for Renewable Energy); and the local grid company will pay the difference to the project

company upon receipt of the subsidies from the government. However, because of the rapid growth of installed capacity of renewable energies, the Tariff Premium Subsidy Fund for Renewable Energy has been unable to pay off the subsidies on time and it has become common for renewable energy projects not to receive the subsidy until a couple of years after being commissioned. In addition to the subsidy from central government, local governments, at provincial or city level, have also formulated subsidy policies or other fiscal incentives to promote the development of renewable energy.

ii The regulatory framework

As mentioned previously, the renewable energy sector is mainly governed by the NEA, NDRC and MOF. According to the present government framework, the NEA is the current energy regulator, established a decade ago under the auspices of the NDRC. The NEA is responsible for making policies for renewable energy from a macro point of view (e.g., allocating the annual quota for wind and solar development in each province, leading the creation of a unified trading market for renewable energy). The NDRC and its local counterparts are management agencies with broad administrative and planning control over the Chinese economy. In terms of their role in renewable energy, they are responsible for approving specific renewable energy projects. Without NDRC approval, investors cannot commence development of a renewable energy project. The MOF, in association with the NEA and NDRC, is responsible for making policies on state subsidies for renewable energy projects. Recent comments from senior government leaders indicate that the Chinese government intends to establish a new Ministry of Energy to streamline and consolidate authority for energy-related issues. The responsibility for these issues is currently dispersed among a variety of other ministries. However, the full extent of the new ministry's authority remains unclear, including whether it will have oversight of China's state-owned oil companies. If this materialises, in addition to expanding NEA's existing authority over energy issues, the creation of a new ministry would elevate China's energy regulator to equal status with the NDRC and the other ministries, reporting directly to the State Council, and the current approval formalities for renewable energy would have to be adjusted accordingly.

Different categories of renewable energy, such as solar, wind, hydro and biomass, have to follow different sets of rules regarding development, operation and subsidy. But generally, they all have to follow these steps: (1) consult with local government regarding the development of the renewable energy project; (2) apply to local authorities in charge of land, zoning, environmental protection, forestation, mining industry, water and soil conservation, historic relics, etc., and to the local grid company for pre-approval or a preliminary opinion on the development of the project, while also carrying out a feasibility study; (3) apply to the local NDRC for project approval by presenting the pre-approvals or preliminary opinions plus the feasibility study report; (4) apply to various local authorities for acquisition of land and construction, and arrange financing; (5) apply to various local authorities and the grid company for completion acceptance, sign a power purchase agreement and apply for a generation licence; and (6) apply for state and local subsidies. The approval formalities for distributed solar and wind projects are much simplified compared to those required for utility-scale projects.

During the complicated approval formalities mentioned above, the legal acquisition of land-use rights is often a key challenge faced by most projects. Utility-scale projects such as solar or wind farms will inevitably have to occupy a vast area of land, which is often located either on the outskirts of cities or deep in rural areas. It is therefore very common for

projects to occupy farmland or forestland, which, according to current PRC law, must not be used for non-agricultural development until the designated land use has been converted to construction land, and then sold or leased to the developer. The PRC law on change of land use and selling of land is quite rigid and it always takes a long time for the local government to go through the necessary internal formalities (often taking one or two years) before the developer can legally acquire the land-use right. However, given the fact that the local counterpart of the NDRC will require the renewable project to be completed within a certain period following the issuance of the NDRC approval (usually one or two years), the developer may not have time to wait for the local land authority to clear all the land acquisition formalities. Thus, it is very common for developers to commence development and construction without clearing the land acquisition formalities, which in turn leads to non-compliance with construction formalities and completion inspection and acceptance formalities. In addition to this non-compliance with formalities, it is also common for developers to be involved in disputes with the local population (villagers) regarding the occupation of farmland or forestland.

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

i Project finance transaction structures

The development of a renewable energy project requires a huge amount of investment and it will take long time before the project generates enough cash to pay off the debt. In addition, the revenue from renewable energy projects may be adversely affected by fluctuations in electricity generation due to weather conditions, changes to subsidy and tariff policies, curtailment, etc., which makes it difficult, if not impossible, for the banks to extend long-term loan facilities to renewable energy projects. However, financial lease arrangements could very well fit the needs of renewable energy projects. As a matter of fact, it is very common in China for developers to team up with financial lease companies to solve financing problems in developing renewable energy projects, and particularly for utility-scale solar, rooftop solar and certain wind projects.

There are two principal structures for financial leases: direct financial lease and the sale-and-leaseback structure. Direct financial lease means that the lessor (i.e., the financial lease company) will raise funds or use its own funds to purchase and pay for relevant equipment and facilities on the instructions of the lessee (usually the project company), and then lease the equipment and facilities to the lessee. Taking a solar farm project as an example, the project company will usually have to contribute at least 20 per cent of the total investment and the lessor, after carrying out due diligence on the project, will usually cover the remaining 80 per cent to purchase solar panels and other equipment, either from the manufacturers or from engineering, procurement and construction contractors. If the lessor finds that the solar farm cannot generate enough cash flow to cover the rent as stipulated in the financial lease agreement, the lessor will require recourse against the investor for the payment obligation under the financial lease agreement.

Sale and leaseback means that the lessor will first purchase the assets from the project company and then lease these assets back to the project company to collect a rent. This structure is usually used for commissioned projects. The term of the financial lease is more flexible and could be as short as a couple of years or as long as a decade, or even cover the entire operating period of the project.

In both direct financial lease and sale-and-leaseback structures, the lessor will always require the project company to pledge its receivables (tariff and subsidy) and the developer to pledge its shares in the project company.

ii Distributed and residential renewable energy

Distributed PV systems, such as rooftop solar, have an important role in solar energy development. On 18 November 2013, the NEA circulated the Provisional Rules on Project Management of Distributed PV Systems, which provided that the approval formalities for distributed PV systems were to be simplified and expedited (e.g., distributed PV systems were no longer required to obtain generation licences, approvals for soil and water conservation and environmental protection assessments); however, distributed PV systems were still subject to quota management similar to that for PV power plants. With effect from 16 March 2015, the NEA issued the Notice on the Photovoltaic Power Generation Development Plan for 2015, which, among other things, provided that rooftop PV systems would no longer be subject to quota management, and that local grid companies must follow simplified formalities to connect rooftop PV systems to the grid, which has since significantly boosted the development of rooftop solar systems.

Similarly to distributed PV systems, the Chinese government is also encouraging the development of distributed wind power projects. On 3 April 2018, the NEA issued the Provisional Rules on Development of Distributed Wind Power. According to these Provisional Rules, distributed wind power projects shall encompass wind power projects in which the electricity generated is to be either consumed on site or fed into the grid. The Provisional Rules further stipulated that the voltage at which distributed wind power projects may feed into the grid was to be increased from 35KV to 110KV, which significantly increased the interest of investors in distributed wind power. In addition, the Provisional Rules also require local governments to simplify project approval formalities and expedite the approval process for distributed wind power projects. Although some state-owned energy tycoons have been seen to participate, the investors in distributed wind power projects are mainly from the private sector, and include the Chinese wind turbine manufacturer Goldwind, and Envision.

As regards residential renewable energy, although there are also other forms of residential renewable energy, such as distributed wind and biomass, in some areas in China, distributed PV systems are the most popular form (e.g., rooftop or wall-mounted solar). Residential renewable energy does not involve complicated approval formalities. Households may start building a system after filling out a registration form, and may be connected to the local grid after going through a quick completion inspection and acceptance. Residential renewable energy does not receive a FIT, but instead receives a fixed subsidy for each kWh of electricity generated by the system. According to the latest government notice, the fixed subsidy for 2019 is 0.18 yuan/kWh. The level of subsidy for residential renewable energy has been decreasing steadily and it is widely expected that it could be cancelled altogether at some point in the following three to five years.

V RENEWABLE ENERGY MANUFACTURING

China is particularly strong in the manufacturing side of the renewable energy industry. There are a considerable number of factories that can manufacture solar panels and wind turbines. According to figures published online,[2] of the top 20 Tier 1 manufacturers of solar panels in the fourth quarter of 2018, 17 were Chinese, and Jinko was ranked number one, followed by JA Solar, Trina Solar, LonGi, GCL and Suntech. Chinese wind turbine manufacturers have also been recognised worldwide. In its 'Global Wind Market Development – Supply Side Data 2018' report, the GWEC found that over half of the top 15 wind turbine manufacturers are based in China.

To incentivise manufacturing, the government has implemented a tax rebate policy, boosting the export of renewable energy products, such as solar panels, wind turbines and auxiliary equipment. On 1 April 2019, the MOF, STA and the General Administration of Customs jointly issued the Notice on Policies Regarding Deepening the VAT Reform, in which the export tax rebate rate for renewable energy products was adjusted to 13 per cent along with the adjustment to VAT.

VI CONCLUSIONS AND OUTLOOK

In 2018, the development of renewable energy enjoyed a rapid increase, despite the adverse impact of the 5·31 Policy, solar power capacity still increased by 34 per cent. However, because of the heavy burden of subsidies, it is believed that the subsidy for renewable energy will eventually be substantially lowered or even cancelled in future. Solar power and wind power will remain centre stage in terms of the transformation of energy structures. The central government is formulating various new policies to support the development of clean energy, including reforms on the trading of electricity, upgrading the green certificate trading mechanism, and mandatory clean-energy quotas. In the long run, improvements in renewable energy technology and the market-oriented reform of the grid will serve as a powerful impetus for the renewable energy industry. In addition, with the application of high-voltage transmission lines, cross-province transmission will become much more convenient and cost-efficient, which will greatly reduce curtailment in some areas of China and will help to establish a nationwide electricity trading network.

2 https://review.solar/latest-tier-1-solar-panels-list-2018/.

Chapter 5

EGYPT

Donia El-Mazghouny[1]

I INTRODUCTION

Before 2014, renewable energy project development was very limited in Egypt. In September 2014, the government launched an ambitious incentives programme for the generation of 4.3GW of solar and wind energy projects. The feed-in tariff (FIT) programme is considered the real breakthrough for renewables development in the country. The target for the first regulatory period (2015 to 2017) of the programme was 2GW of wind (20–50MW), 2GW of utility-scale solar photovoltaic (PV) (0.5–50MW) and 300MW of small-scale PV (less than 500kW). Of 178 solar bids, 67 consortia qualified with a total capacity of 2,880MW, and the utility-scale PV tender was oversubscribed by a factor of two, but of the 48 consortia bidding for wind projects, only 27 qualified, amounting to 1,670MW,[2] and not all projects reached completion.

On 21 December 2014, Egypt published the Renewable Energy Law,[3] identifying four main mechanisms to reach its renewable energy targets:

a state-owned projects with competitive bidding for engineering, procurement and construction (EPC) contracts;

b competitive bidding for build-own-operate (BOO) contracts;

c feed-in tariffs; and

d a merchant scheme according to which independent power producers can enter into bilateral contracts to sell power directly to consumers using the national grid against wheeling and grid-access charges payable to the grid operator.[4]

A number of renewables developments subsequently went ahead, then, on 8 July 2015, the new Electricity Law[5] was published, followed on 23 May 2016 by its implementing regulations issued in Decree No. 230/2016 of the Minister of Electricity and Renewable Energy, which encouraged energy efficiency and the generation of electricity from renewable sources, as well as providing for the complete independence of the activities of generation, distribution and transmission of electricity to achieve a liberalised and competitive electricity market.

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2 'Egypt Renewable Energy Feed-in Tariff by Tender', BloombergNEF, available to registered users at https://www.bnef.com/policy/4386.

3 Renewable Energy Law No. 203/2014.

4 'Egypt Merchant Scheme (Bilateral Agreements)', BloombergNEF, available to registered users at https://www.bnef.com/policy/5234.

5 New Electricity Law No. 87/2015.

II THE YEAR IN REVIEW

The three years between Q4 2014 and Q4 2017 have completely transformed the renewable energy scene in Egypt. Two Prime Ministerial Decrees, No. 1947/2014 (published on 27 October 2014) and No. 2532/2016 (published on 29 September 2016) established the offtake tariffs applicable to the first and second regulatory periods of the Egyptian solar and wind feed-in tariff programme respectively (Round 1 and Round 2 of the FIT programme). Large-capacity solar projects (between 20MW and 50MW) were paid a tariff of 14.34 US cents/kWh, reduced to 8.40 US cents/kWh by the Round 2 decree, while wind projects of the same capacity were paid a tariff between 4.60 US cents/kWh and 11.48 US cents/kWh, reduced to between 4 US cents/kWh and 7.96 US cents/kWh by the Round 2 decree depending on the maximum operating hours of the wind plant. The equally split 4GW of utility-scale solar and wind projects attracted a lot of interest from international developers and investors, while the 300MW of distributed solar projects (of less than 500kW capacity) have seen limited uptake.

Round 1 of the FIT programme ran into a roadblock when projects failed to achieve financial closure in the summer of 2016[6] because of a foreign exchange shortage in Egypt and an arbitration arrangement considered unfavourable by a number of development finance institutions (DFIs) providing the main portion of the senior debt to Round 1 projects. Only two solar project companies had managed to execute a power purchase agreement (PPA) with the Egyptian Electricity Transmission Company (EETC) as offtaker with a total capacity of 100MW out of the 136 solar and wind qualified consortia. However, following the devaluation of the Egyptian pound on 3 November 2016, and after the government had addressed the issue related to the seat of arbitration in the programme's principal project agreements, 30 project companies have successfully signed PPAs with EETC, raising the capacity to be installed in the Benban Solar Park (Aswan, in the south of Egypt) to 1,465MW with a total investment cost of about US$2 billion, out of the Park's maximum capacity of 1,750MW distributed over 45 plots of land with a total surface area of about 37 square kilometres.[7]

The success of the Benban solar projects was echoed by the 250MW Gulf of Suez wind project developed by a consortium of French, Japanese and Egyptian sponsors reaching financial closure in December 2017 (and increasing its maximum capacity by an additional 500MW), and another wind project developed by a British consortium is following suit and expects to reach financial closure soon.

The government is also planning the development of a first-of-its-kind pumped storage hydropower plant in Africa and the Middle East: the Ataqa hydropower plant is expected to have a capacity of 2,400MW, to cost US$2.6 billion and to be completed in 2024.[8]

6 Sakr, Dalia Abdelhamid Mahmoud; Huenteler, Joern Torsten; Matsuo, Tyeler Marissa; Khanna, Ashish. 2017. 'Scaling up distributed solar in emerging markets: the case of the Arab Republic of Egypt' (English). Policy Research working paper; No. WPS 8103. Washington, DC: World Bank Group. http://documents.worldbank.org/curated/en/815911497878875622/Scaling-up-distributed-solar-in-emerging-markets-the-case-of-the-Arab-Republic-of-Egypt.

7 'Benban Solar Park', *EEHC News Magazine*, Issue No. 4, May 2018, pp. 14–15.

8 'Project Spotlight: 2,400-MW Ataqa pumped storage in Egypt', HydroWorld.com, 7 February 2018, available at https://www.hydroworld.com/articles/2018/02/project-spotlight-2-400-mw-ataqa-pumped-storage-in-egypt.html.

III THE POLICY AND REGULATORY FRAMEWORK

i The policy background

Renewable energy policies and incentives are established at the national level by the government, typically through the Cabinet of Ministers. The government has a target for 20 per cent of electricity consumption to be generated from clean energy sources by 2022 and 37 per cent by 2035, according to the Energy Strategy approved in 2016. Of the 2022 goal, 12 per cent is set to come from wind energy, with the remainder coming from small hydro and solar projects.[9]

The new Investment Law,[10] published on 31 May 2017, granted a special investment incentive to projects generating renewable energy or depending on it, consisting of a deduction of 30 per cent of the net taxable profits for the first seven years of the life of the project, subject to certain conditions, such as the incentive value not exceeding 80 per cent of the paid-in capital until the start of the project's operations and the project company being established within three years of the date of entry into force of the implementing regulations issued in Prime Ministerial Decree No. 2310/2017 (i.e., from 29 October 2017). The Investment Law also creates a 2 per cent unified rate of customs duties for all equipment and machinery necessary for the establishment of the project (down from 5 per cent). Land may be allocated free of charge if the project company's activity is deemed of strategic interest; otherwise, 2 per cent of the production is generally payable yearly for land lease (based on the Renewable Energy Law).

In 2013, Egypt introduced a net-metering scheme to promote distributed solar. The scheme allows small-scale renewable energy projects in the residential and industrial and commercial sectors (with a maximum capacity recently increased from 5MW to 20MW) to feed electricity into the low voltage grid. It does not specify a limit on installed capacity, meaning that customers can connect a system that produces more electricity than they consume; however, systems are limited to the low voltage level, typically around 380 volts. Under the scheme, solar PV generation is credited against the user's bill for consumption from the grid using a calculation method that credits surplus electricity only in consumers' highest tariff bracket (adopted to maximise bill savings).[11]

In addition to the utility-scale solar projects, the FIT programme had also proposed tariffs for distributed PV ranging from E£0.848/kWh for residential systems below 10kW up to E£0.973/kWh for systems between 200kW and 500kW. These tariffs were lower than those for utility-scale projects because the government envisioned that distributed solar investors would have access to concessional finance in local currency, as the Ministry of Finance had proposed a financing programme under which investors could receive concessional loans at 4 per cent interest for installations below 10kW and 8 per cent for installations below 500kW. However, this concessional finance programme was never implemented, but Egyptian SMEs are now (since January 2016) eligible for loans at a 5 per cent interest rate.

9 'Egypt Renewable Energy Target', BloombergNEF, available to registered users at https://www.bnef.com/policy/1500.

10 New Investment Law No. 72/2017.

11 Sakr, Dalia Abdelhamid Mahmoud et al., 'Scaling up distributed solar in emerging markets: the case of the Arab Republic of Egypt', 2017.

As such, the new tariffs proposed in the FIT Round 2 decree were higher for distributed solar at E£1.0288/kWh up to E£1.0858/kWh for systems below 500kW (with increases of between 4.8 and 28.6 per cent).[12]

The merchant or independent power producer model provided for in the Renewable Energy Law also allows private offtakers to enter into agreements with private power generation companies to secure the purchase of electricity from renewable energy sources. However, in practice, the use of this model is still in its early stages, and typically appeals to energy-intensive industries, especially in the cement sector, and to some oil and gas companies in line with their mandates and renewables targets under the Paris Agreement (within the United Nations Framework Convention on Climate Change).

The annual electricity price hikes introduced by Decree No. 157/2018 of the Minister of Electricity and Renewable Energy are increasing the demand for renewable energy generation projects, particularly in the commercial and industrial segments. It remains to be seen how this will impact the renewable energy generation schemes proposed by the Renewables Law.[13]

ii The regulatory framework

Egypt mainly had a single buyer electricity market, with the Egyptian Electricity Holding Company (EEHC) being the main player and owner of the transmission system and almost all the distribution assets. Under this model, EETC, a state-owned company (previously an EEHC subsidiary), purchases electricity from all public and private generation companies, and sells it to nine main distribution companies and other private electricity distribution companies. It also directly sells electricity to a number of consumers connected to the extra-high voltage and high voltage networks. EETC is also responsible for power exchanges with neighbouring countries over the present interconnections.

The New and Renewable Energy Authority (NREA), established in 1986, is the arm of the Egyptian Ministry of Electricity and Renewable Energy (MOERE) tasked with developing renewable energy programmes in Egypt on a commercial scale, as well as implementing related energy conservation programmes.

The Egyptian Electric Utility and Consumer Protection Regulatory Agency (EgyptERA), established in 2000, is the independent legal entity that grants licences for the generation, transmission and distribution of electricity, and that is responsible for overseeing compliance with the existing rules and regulations in the electricity sector.

Egypt aims at gradually replacing the current model with a competitive market, based on bilateral contracts, together with spot, balancing and ancillary services markets. The Electricity Law lays the ground for this transformation, with EETC separating from EEHC and becoming independent from all electricity companies and electric utility parties, and establishing third-party access to its network, as well as allowing for the reorganisation of EgyptERA, granting it the right to approve different electricity tariffs. In addition, the Renewable Energy Law provides for different schemes for the development of renewables projects so as to enable the government to reduce Egypt's dependence on fossil fuels and reach its target of renewables in the energy mix.

The Renewable Energy Law defines renewable energy resources as 'natural sources of energy, which are non-depletable, and which may be used to produce electricity'.

12 ibid.

13 Renewables Law No. 203/2014.

Egypt is a party to both the United Nations Framework Convention on Climate Change and the Kyoto Protocol by virtue of their ratification on 5 March 1995 and 12 December 2005 respectively.[14] The Kyoto Protocol binds its state parties included in Annex I (the Annex I Parties) to reducing their greenhouse gas emissions to certain targets over the course of periods known as 'commitment periods'.[15] The first commitment period under the Protocol started in 2008 and ended in 2012, and the second commitment period will end on 31 December 2020.[16]

Since Egypt is not an Annex I Party, it is not bound by specific emission targets. It is, however, involved in the Protocol's Clean Development Mechanism (CDM), as outlined in Article 12 of the Kyoto Protocol,[17] which allows states with emission-reduction (or emission-limitation) commitments to implement an emission-reduction project in a developing state, which in turn can 'earn saleable certified emission reduction (CER) credits, each equivalent to one tonne of CO2 . . . [These credits] can be traded and sold, and used by industrialised countries to a meet a part of their emission reduction targets under the Kyoto Protocol'.[18] As such, the CDM allows emission-reduction projects in developing countries to earn one CER credit for each tonne of CO2.

The implementation of the CDM in each member state is conducted under the auspices of a designated national authority (DNA), whose work is overseen by the CDM Executive Board. The CDM Executive Board constitutes the point of contact for CDM project participants for the registration of projects and the issuance of CERs. The Board supervises the CDM under the authority and guidance of the Conference of the Parties, the ultimate decision-making body of the Convention. The role of the CDM Executive Board includes, but is not limited to: (1) developing procedures for the CDM; (2) approving new methodologies; (3) accrediting designated operations entities; (4) registering projects (in accordance with specific procedures); and (5) issuing CER credits earned through CDM projects in accordance with specific procedures.

The Egyptian DNA is subordinate to the Egyptian Environmental Affairs Agency and consists of two bodies: (1) an executive body, the Egyptian Council for CDM (EC-CDM), which comprises representatives of certain ministries, including, but not limited to, the

14 The Convention was approved in Egypt by Presidential Decree No. 386/1994 and ratified by Minister of Foreign Affairs Decree No. 4/1994. Later, the Kyoto Protocol was ratified by Presidential Decree No. 227/2003.

15 Annex I Parties are parties to the Convention who, in accordance with Articles 3 and 4 of the Kyoto Protocol, undertake to, individually or jointly, reduce their overall emissions of greenhouse gases by at least 5 per cent below 1990 levels in commitment period 2008 to 2012 and by 18 per cent below 1990 levels in commitment period 2013 to 2020. (Article 3 of the Kyoto Protocol (http://unfccc.int/resource/docs/convkp/kpeng.pdf) and Doha Amendment to Kyoto Protocol, dated 8 December 2012 (http://unfccc.int/files/kyoto_protocol/application/pdf/kp_doha_amendment_english.pdf)).

16 The Kyoto Protocol dated 11 December 1997 (http://unfccc.int/kyoto_protocol/items/2830.php) and the Doha Amendment to the Kyoto Protocol, dated 8 December 2012 (http://unfccc.int/files/kyoto_protocol/application/pdf/kp_doha_amendment_english.pdf).

17 In accordance with Article 12 of the Kyoto Protocol, the purpose of the CDM 'is to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3'.

18 United Nations Framework Convention on Climate Change (UNFCCC), Clean Development Mechanism (CDM) (http://unfccc.int/kyoto_protocol/mechanisms/clean_development_mechanism/items/2718.php) and UNFCCC, CDM, 'What is the CDM?' (http://cdm.unfccc.int/about/index.html).

Ministry of Investment and International Cooperation and the Ministry of Petroleum, as well as having a technical division; and (2) the Egyptian Bureau for CDM (EB-CDM), which comprises experts providing technical recommendations to the EC-CDM. Both the EC-CDM and the EB-CDM play a role in deciding on the issuance of CER credits.

The board of EgyptERA is ultimately responsible for ratifying the rules, conditions and processes related to the issuance and trading of all renewable energy certificates.

In addition to the Egyptian Transmission Grid Code and the Egyptian Distribution Network Code, a Solar Energy Grid Connection Code and a Wind Farm Grid Connection Code set the special requirements for the connection of solar and wind farms to the medium, high and extra-high voltage distribution and transmission systems, as the case may be.

The Electricity Law requires projects set up for the generation, distribution or sale of electricity to be developed through Egyptian joint-stock companies. Such companies must seek a preliminary and then a final power generation licence from EgyptERA to be allowed to carry out their activities.

The Companies Law[19] requires a minimum of three founders to incorporate a joint-stock company and capital of at least E£250,000. Incorporation itself, followed by commercial and tax registration, could be completed in as little as one week; however, the compilation of the documents required for incorporation typically takes longer, between one to two months on average.

Following incorporation, and in anticipation of the commencement of generation, which is the licence most commonly sought by private investors, the project company must identify a plot of land for the project, and have a pre-feasibility study carried out, as well as submit an application to EgyptERA to obtain an interim power generation licence for the project. This is typically issued within a maximum of 60 days for a period of one year, with an option for renewal. Then, upon completion of the full feasibility study, the project submits to EgyptERA an application for a permanent power generation licence, issued within a maximum of 60 days, which is renewable on a yearly basis.

Environmental considerations

Egypt is one of the most significant corridors for bird migration in the world, used by millions of birds during migration seasons. More than 470 bird species have been recorded in the country; the majority are non-breeding seasonal visitors, and about 150 species are breeding residents found year-round. Egypt also has a population of 19 globally threatened species and 34 sites declared as important bird areas.[20] Wind projects established in Egypt must therefore carry out full technical and bird migration studies covering all seasons of the year before being granted a power generation licence.

Both solar and wind projects must also consider cultural and mineral resources and obtain avian and military clearances before being set up. Public land offered to investors for the development of renewables projects is typically fully permitted, which facilitates the process of obtaining power generation licences, hence the high demand for such land, especially for utility-scale projects where senior lenders have a keen interest in the project's environmental attributes.

19 Companies Law No. 159/1981.

20 Ibrahim WAL, 2011, 'An overview of bird migration studies in Egypt', *Ring* 33, 1–2: 55–75.

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

i Project finance transaction structures

For a long time, companies operating under the MOERE umbrella dominated the Egyptian electricity market. Private companies are now entering this market, mainly through BOO projects that are particularly seen in the wind field, or the FIT programme, which has positively impacted a renewables market that was rather stagnant, and created an influx of foreign direct investment opportunities in renewables projects that is unprecedented in the Egyptian electricity market. Large foreign utilities, energy providers, EPC companies, operating and maintenance service providers, DFIs and more generally international finance institutions (IFIs), as well as foreign and local commercial banks, have had Egypt on their radar for the past four years as a country with large investment potential in renewables.

Most utility-scale renewable energy projects in the country are funded mainly through non-recourse project finance and a smaller equity portion (in the range of 75:25 or 80:20). Loans are typically sourced from IFIs and DFIs, such as the International Finance Corporation, European Bank for Reconstruction and Development, European Investment Bank, Japan Bank for International Cooperation, Japan International Cooperation Agency or the African Development Bank for tenures of 12 to 18 years. Where EETC is the offtaker, senior lenders now generally require a sovereign guarantee from the Ministry of Finance or Central Bank of Egypt for payments by the transmission company to the seller, as well as a seat of arbitration outside Egypt for the PPA. They also require double-layered security for projects to ensure full protection in the case of default against lengthy enforcement procedures in Egypt, which may require public authorities' interference or court orders in certain instances.

The construction of renewables projects is typically undertaken as lump-sum turnkey projects, with the design and procurement largely carried out by highly specialised companies located outside Egypt, and the installation and civil works, in addition to limited scope procurement, by local contractors and sub-contractors. Construction is largely financed by IFIs for private sector projects, or through grants from international donors for NREA projects. A very limited portion of the funding and part of the bonding is sourced from local commercial banks, given that most of the project components are sourced from outside Egypt in foreign currency, and local banks are legally required to lend in foreign currency only where the projects' profits are generated in foreign currency (while most of the utility-scale projects in which EETC is the offtaker are paid in local currency, in the equivalent of the tariff priced in US dollars).

ii Distributed and residential renewable energy

In January 2013, EgyptERA adopted a net-metering policy by virtue of Circular No. 1/2013, which allows small-scale renewable energy projects to feed in electricity to the national grid. Generated surplus electricity is discounted from the balance through the net-metering process.

Rooftop and small-scale solar power generation was also promoted by the government, with the FIT programme dedicating 300MW of its fixed tariffs to projects of a capacity not exceeding 500kW. All produced electricity is fed into the national grid operated by EETC.

Off-grid solar power plants are encouraged by EETC but are not widespread. Most off-grid projects rely on photovoltaic technology, and hence lack the required stability and continuity of operation throughout the day. Battery storage systems are not yet commonly used in Egypt, but their use is expected to increase following the lifting of subsidies for fuel and electricity tariffs by the government.

As fuel and electricity have been largely subsidised by the government, residential solar projects were not financially appealing, and the lack of solid regulatory support for such projects has gone unnoticed as a result. Following the lifting of subsidies, it is expected that privately owned solar projects will become more common.

iii Non-project finance development

Regarding renewable energy projects that have been developed using non-project finance structures, there is no reliable publicly available data in this respect.

V RENEWABLE ENERGY MANUFACTURING

Through a joint venture between EEHC and a Chinese company, Egypt manufactures mainly high-voltage electric equipment and switchgear, such as gas-insulated switchgear for power transformers of 66kV up to 220kV, power capacitors and lighting arresters. Again through a joint venture with another Chinese manufacturer, EEHC contributes to a factory for the production of multiple types of low-voltage switchgears that are tailor-made to meet local demand. A large Egyptian manufacturing group dominates the local cables market and owns several manufacturing facilities in the region as well.

In May 2018, Egypt's Ministry of Military Production signed a memorandum of understanding with a large Chinese group to build a solar panel facility at a cost of up to US$2 billion. The facility is expected to manufacture panels capable of producing 5GW annually.

Based on Minister of Finance Decree No. 106/2017, the applicable value-added tax on imported machinery and equipment used in the production and provision of services if considered a single production line is 5 per cent, instead of the standard rate of 14 per cent. It is applicable to solar and wind plant equipment even when shipped in different consignments.

VI CONCLUSIONS AND OUTLOOK

The government has a long-term plan of diversification of the energy mix and reduction of dependence on fossil fuels, which pre-dates the large Zohr gas discovery offshore from Egypt.

Although the FIT programme generated a lot of interest in the market for large-scale projects, the development of distributed solar remains almost inexistent. The potential of renewables development in the commercial and industrial segments also remains largely untapped. The framework for the setting up of commercially viable waste-to-energy projects also remains in gestation, as it requires close coordination between MOERE and the Ministry of Environment, as well as a solution to the lack of an efficient waste collection system. Low pricing is also an issue, particularly given that payment will take place in Egyptian pounds without pegging to the US dollar. In November 2015, the government approved FITs for refuse-derived fuel and electricity generated from solid waste at a preliminary price of E£0.92/kWh. It was also reported to have agreed to issue grants to governorates to help subsidise recycling efforts that feed into the programme, and facilitate land concessions on a usufruct basis for companies seeking to develop waste-to-energy power plants.

In sum, Egypt has the basic legislation in place to encourage the development of renewable energy projects, and has experienced great success with the FIT programme in the form of the one-stop shop created within EETC to govern and liaise on all regulatory aspects related to projects: the Central Unit for Feed-In Tariffs. However, smaller-scale projects and developments in the commercial and industrial sectors, which mainly have to deal with

distribution companies on the lower-voltage networks, do not enjoy the same benefits. There is also a lack of clarity with respect to the licensing process for such projects, and a lack of support in relation to the permitting of the land required to establish the projects, as well as a lack of detailed information regarding potential opportunities for investment in renewables in general. Solutions to these issues could largely be facilitated by the government should it wish to boost renewables development in the coming years, especially in view of the natural uptake resulting from the recent hikes in electricity prices.

A committee was formed in 2019 to draft implementing regulations for the Renewable Energy Law, with a view to addressing all the gaps in the current regulatory framework. It remains to be seen whether these regulations for the 2014 Law will ultimately be issued independently, or whether both the Renewable Energy Law and its implementing regulations will instead be integrated into the Electricity Law and its regulations.

Chapter 6

GERMANY

Markus Böhme and Carsten Bartholl[1]

I INTRODUCTION

Over the years, the development of renewable energy in Germany has been, foremost, on the basis of the German Renewable Energy Act (EEG). Whereas traditionally the German scheme for renewable energy relied on fixed feed-in tariffs provided under the EEG, the current version – the EEG 2017[2] – has shifted the framework to an auction system for the more significant onshore forms of renewable energy production (wind energy and large-scale photovoltaic solar installations (solar PV)).[3] Tenders for offshore wind energy are subject to a separate law, the Code on the Development and Support of Wind Energy at Sea.[4]

The main drivers, and the focus of both investment and financing, in renewable energy in Germany are onshore wind energy, solar PV and – specifically because of its very large project volumes – offshore wind energy. Biogas and biomass played a more significant role in previous years. There are also some utility-scale geothermal projects to be seen, as well as some hydropower projects.

Because of fundamental errors in the design of the EEG 2017 auction system,[5] newly installed capacity in offshore wind in Germany only reached a level of 2,400MW in 2018 (compared to 5,000MW of newly installed capacity in 2017). At the end of 2018, 29,213 onshore wind turbines were operative in Germany with an overall rated power of 53GW.[6] Newly installed capacity for solar PV in 2018 in Germany has outperformed onshore wind energy, with 2.81GWp of new capacity (compared to 1.66GWp in 2017). At the end of 2018, Germany had a total installed solar PV capacity of 45.9GWp, with more

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2 German Renewable Energy Act 2017 (EEG 2017) – Erneuerbare-Energien-Gesetz 2017 as of 21 July 2014 (BGBl. I S. 1066), latest amendment dated 13 May 2019 (BGBl. I S. 706).

3 Solar photovoltaic (PV) installations of or above 750kWp rated power are subject to a successful auction bid.

4 Code on the Development and Support of Wind Energy at Sea – Gesetz zur Entwicklung und Förderung der Windenergie auf See as of 13 October 2016 (BGBl. I S. 2258, 2310), latest amendment dated 13 May 2019 (BGBl. I S. 706).

5 For projects (allegedly) owned by citizens of the municipality for which the project was (allegedly) intended, participation in a tender did not require a permit. The first two auction rounds in Germany under the EEG 2017 were almost entirely awarded to such citizens energy projects that did not have permits, and thus not only are the bulk of these projects not under construction yet, they have also blocked projects with permits from winning a bid (see also Section II.ii).

6 https://www.wind-energie.de/themen/zahlen-und-fakten/deutschland/.

than 1.6 million installations[7] of all types (from small domestic household installations to utility scale).[8] By comparison, Germany has 2.36 million (mostly small-scale) solar thermal installations, with a total capacity of 14.4GWth.[9] In the past year, 140 new offshore wind turbine generators were installed, with a rated power total of 970MW (compared to 1,250MW in 2017). Overall, offshore wind energy in Germany accounts for a rated power of 6.38GW, which is slightly above one third of the total installed capacity for offshore wind in Europe.[10]

In 2018, approximately 17 per cent of the overall energy consumption in Germany was satisfied from renewable energy sources (of which, in turn, 53 per cent was accountable to electricity, 40 per cent to heat and 7 per cent to biofuels and traffic or mobility). Renewable energy in Germany had a share of 37.8 per cent in the satisfaction of the overall electricity consumption in Germany in 2018 (compared with 36 per cent in 2017).

In 2018, Germany saw fewer renewable energy transactions for newly developed projects, mainly on account of the significant reduction of newly installed capacity in the onshore wind sector. German investors and German financing banks have therefore put more focus on international business and projects outside Germany, mainly within Europe.

II THE YEAR IN REVIEW

During the past months, German renewable energy law was mainly subject to amendments resulting from national law. Apart from that, a decision of the European Court of Justice (ECJ) is of particular note since it will have a significant impact on the interaction between the German federal parliament, the Bundestag, and the European Commission in Brussels regarding the future promotion of renewable energies.

i ECJ decision regarding denial of state-aid character of the EEG 2012

On 28 March 2019, the ECJ ruled that the EEG 2012 does not constitute a state-aid provision within the meaning of Article 107(1) of the Treaty on the Functioning of the European Union.[11] It has thus set aside the first-instance judgment of the General Court of the ECJ (the General Court) and annulled the contested decision of the European Commission. This gives the Bundestag considerable room to manoeuvre, as to date similar levy systems have, as a precautionary measure, been notified to the Commission in the form of state aid (e.g., the Combined Heat and Power Act, and the regulation on individual grid fees under Section 19 Paragraph 2 of the Electricity Network Fee Regulation Ordinance). The lynchpin of the legal dispute was the question of whether the EEG levy was state resources. The ECJ has now denied this – maintaining the position adopted in the *PreussenElektra* case of 2001.

7 https://www.ise.fraunhofer.de/content/dam/ise/de/documents/publications/studies/aktuelle-fakten-zur-photovoltaik-in-deutschland.pdf, page 5.

8 In West Germany, between 75 per cent and 95 per cent of installations are rooftop installations, whereas in East Germany rooftop installations constitute between 35 and 55 per cent, depending on the particular state they are built in. A current trend in Germany is the development of solar PV farms with a rated power of around 100MW or more, and these are aimed at power purchase agreements with large offtakers.

9 https://www.solarwirtschaft.de/fileadmin/user_upload/bsw_faktenblatt_st_2019_3.pdf.

10 https://www.offshore-windindustrie.de/.

11 Decision C-405/16 P.

In its judgment, the ECJ held that state resources are not used, since the EEG 2012 does not oblige utilities to pass on the amounts paid based on the EEG levy to end consumers (Paragraph 70 of the judgment). The ECJ held that the fact 'that "in practice", the financial burden resulting from the EEG surcharge was passed on to the final customers and, consequently, could "be assimilated, from the point of view of its effects, to a levy on electricity consumption"' is not sufficient for the state to have power of disposal over the funds from the EEG levy (Paragraph 71 of the judgment). However, the General Court 'failed to establish that the State held a power of disposal over the funds generated by the EEG surcharge or even whether it exercised public control over the [transmission system operators] responsible for managing those funds' (Paragraph 73 of the judgment). Even if public authorities (in this case the Federal Network Agency) control the proper implementation of the EEG 2012, this does not automatically lead to the conclusion that the funds generated by the EEG levy are themselves under state control (Paragraph 80 of the judgment).

The ECJ decision has important consequences regarding the question of which rules obtain in the creation of national promotion and levy systems; the parliaments of the Member States have thus regained considerable powers as a result, and can now decide quickly and flexibly on the design of such systems without the prior involvement of the European Commission. The significance of the current revision of the Environmental Protection and Energy Aid Guidelines 2014–2020 will therefore decline in the present context.

ii Legislative amendments to the EEG

The significant legal changes of the past year arose primarily as a result of the Energy Collective Act.[12]

First of all, the tendering system for renewable energy that was introduced by the EEG 2017 was adjusted with regard to tender types, volumes and modalities. In general, the legislature expects better quantity control and greater cost efficiency from tenders. Thus, installations that are not exempted from the tendering obligation pursuant to Section 22 Paragraph 2 EEG 2017 only receive financial support if the Federal Network Agency has awarded the plant a contract in the tendering procedure. Only onshore wind turbines and solar plants with an installed capacity of up to 750kW do not have to submit tenders. The administratively fixed remuneration rates continue to apply to them.

As a short-term contribution to achieving the 2020 national climate-protection target, and to avoiding feared construction gaps in the onshore wind energy sector,[13] it was stipulated that, as of 1 September 2019, special invitations to tender for a total of 4GW each of installed capacity for solar and for wind turbines on land would be issued. In addition, the first innovation tenders will also take place on 1 September 2019. Innovation tenders will focus on the testing of new pricing mechanisms and tendering procedures, and should lead to more competition and more network and system serviceability. Tenders will be invited on 1 September each year, for 250MW in 2019, 400MW in 2020 and 500MW in 2021.[14] Tender volumes not awarded will generally be carried over to the following calendar year.

With regard to onshore wind, shorter implementation periods of 24 months instead of the usual 30 months will apply to bidders awarded a contract in the first three tender rounds in 2019. The background to this is the fear that a construction gap will arise after privileged

12 Energy Collective Act – Energiesammelgesetz as of 17 December 2018 (BGBl. I S. 2549).

13 See Section I.

14 Section 28 Paragraph 6 S. 1 EEG 2017.

citizens energy companies[15] were awarded contracts almost exclusively in the tenders throughout 2017, in accordance with Section 36g EEG 2017, and benefited from, among other things, no permit requirement and an extended implementation period of 54 months.

For this reason, the further suspension of privileges for citizens energy companies until the first half of 2020 had already been decided before the introduction of the Energy Collective Act. In this way, economic distortions among wind turbine manufacturers and the supply industry are to be avoided by completely displacing the privileged bidders. In a new regulation, it is planned to link the right to award a contract to the existence of an emissions-related licence for turbines, pursuant to the Federal Act on Protection against Emissions (BImSchG).[16]

iii Acceleration of electricity network expansion

In line with increasing electricity production from renewable energies, the federal government wants to accelerate the expansion of the electricity network through the amendment of the Network Expansion Acceleration Act (NABEG). The new Act entered into force on 13 May 2019 and is intended to simplify the approval procedures required for network expansion. This applies to the many steps involved, from the determination of requirements (including future requirements) and the search for a suitable route to planning approval and concrete construction.

Under certain circumstances, the construction of parts of a new route can already begin, even if the final metre has yet to be approved. Simplifications should be possible in particular where people, the environment and space are only slightly affected. In the case of large new construction projects, on the other hand, participation options are retained.

Above all, the Act enables foresighted planning and approval. If a channel has already been dug, it should also be possible to lay empty conduits through which pipes can be laid later, saving costs in the long term.

In addition, the differing compensation regimes for owners of agricultural and forestry land has proved to be an obstacle to network expansion. The Act therefore harmonises and legalises compensation payments nationwide and moderately increases acceleration bonuses. Last but not least, it provides for better cooperation and coordination between the federal, state and local governments in this matter, with a view to avoiding conflicts from the outset.

iv Restriction of feed-in priority for renewable electricity and changes to redispatch

In addition to fossil fuel power plants, from 1 October 2021 renewable energy plants or combined heat and power (CHP) plants will also be included in the management of grid bottlenecks. The federal government expects lower grid costs and a lower use of fossil fuel power plants as a result of this step. Together with the amendment of the NABEG, changes will be made to 'redispatching'; this regulates the reduction and increase of generation capacity before and after grid bottlenecks. To date, only fossil fuel power plants have been used for redispatching; in future, renewable energies and CHP plants can also be included. The regulations for feed-in management will be transferred to redispatch with the change. The feed-in priority will thus be lifted to some extent. In future, renewable energy plants are

15 Bürgerenergiegesellschaften.

16 Federal Act on Protection against Emissions – Bundesimmissionsschutzgesetz as of 17 May 2013 (BGBl. I. S. 1274), latest amendment dated 8 April 2019 (BGBl. S. 432).

to be included in redispatching if this allows the regulation of multiple conventional power plants to be eliminated. The federal government assumes that the change will reduce the use of fossil fuel must-run capacities, since fewer plants will have to be turned down before the bottleneck and fewer plants will have to be turned up after the bottleneck. In addition, according to the government's expectations, the use of balancing energy, which until now has come almost exclusively from fossil fuel power plants, will decrease.

III THE POLICY AND REGULATORY FRAMEWORK

i The policy background

As mentioned above, the ECJ decided in March 2019 that the EEG 2012 could not be qualified as state aid and thus annulled contrary decisions from the European Commission and the General Court. However, at the request of the European Commission, Germany had already changed its subsidy scheme before the ECJ rendered its decision, and brought the legal framework into line with the European Commission's 'Guidelines on State aid for environmental protection and energy 2014–2020'.

Since 1 January 2017, the promotion of renewable energies in the electricity sector has been determined largely on a competitive basis. The EEG 2017 ended the phase of technology promotion with politically fixed prices and the amount of the required remuneration for electricity from renewable energies has since been determined via auctions. Further expansion will thus take place at competitive prices. The level of remuneration for onshore and offshore wind energy, solar PV and biomass will be put out to tender. Small plants are excluded from this tendering obligation.

The EEG levy finances the promotion of renewable energy plants in Germany. The annual total amount is calculated from the difference between the expenses for remuneration and premium payments and the income from marketing revenues of the grid operators, the 'EEG differential costs'. This amount is then passed on to the electricity customers as a consumption levy and paid automatically with the electricity bill.

With regard to encouraging greater technological developments, the EEG 2017 has implemented cross-technology tenders and innovation tenders.

In a pilot project in the years 2018 to 2020, joint tenders for onshore wind power plants and solar power plants will be conducted. The aim of the joint tenders is to test the functionality and effects of cross-technology tenders and to evaluate the results, in comparison to technology-specific tenders.

The aim of the innovation tenders is to promote particularly grid- or system-supporting installations that prove to be efficient in competition. The content requirements are 50MW per year for the years 2018 to 2020 and participation is not limited to individual renewable energies. It will therefore also be possible to bid for combinations of different renewable energies.

Furthermore, it is foreseeable that the decisions of the Commission for Growth, Structural Change and Employment (the Coal Commission), which was set up by the German federal government in June 2018, will have a big impact on the market for renewable energies. In its final report, rendered to the German government at the end of January 2019, the Coal Commission has agreed to phase out coal by 2038 at the latest. Furthermore, this should be checked by 2032 to see whether the phase-out date can be brought forward to 2035 at the earliest, in agreement with the operators. Additionally, the Commission agreed on a total of €40 billion in aid for the different states affected by the coal withdrawal. The

federal government agrees with the Commission that the goals of climate protection, the creation of new jobs, security of supply, competitiveness and social compatibility are equally important. In particular, the electricity supply in Germany must remain secure and affordable and the resulting supply gap must be closed by renewable energies. In the future, Germany should thus be developed into a model country in terms of energy policy.

Last but not least, the European Comission's Clean Energy for All Europeans package must be considered a significant step regarding the implementation of the energy union strategy, and it will have a wider effect on energy performance in building, energy efficiency, governance regulation, electricity market design and the renewable sector. As regards the renewable energy sector, the recast renewable energy directive entered into force in December 2018. With a view to showing global leadership on renewables, the EU has set an ambitious, binding target of 32 per cent for renewable energy sources in the EU's energy mix by 2030. Thus, the European context also provides future support regarding the expansion of renewable energy in the years to come.

ii The regulatory framework

Regulators of renewable energy

As an agency of the Federal Ministry for Economic Affairs and Energy, the Federal Network Agency is the main regulator for renewable energy. The Federal Network Agency's core task is to ensure compliance with, inter alia, the Energy Economy Act,[17] the EEG and their respective ordinances. In this way, it guarantees the liberalisation and deregulation of the energy market through non-discriminatory network access and efficient system charges. The Federal Network Agency's decisions in the energy sector are made by its Ruling Chambers. Companies directly concerned may participate in the Ruling Chamber proceedings and business circles affected by the proceedings may be invited to attend. Decisions can be challenged before the civil courts. Furthermore, although the Federal Ministry for Economic Affairs and Energy is the relevant supervising authority, it cannot overturn a decision made by the Ruling Chambers since their members act with a judge-like independence.

In this way, the Federal Network Agency ensures a reliable and low-priced supply of electricity, issues administrative orders to concretise legal requirements,[18] provides tender procedures for renewable energies and supervises the correct application of the law.

Tracking of renewable energy and renewable energy credits

The monitoring of the development of renewable energy takes different forms. First, the Market Master Data Register commenced operation on 31 January 2019. As a comprehensive energy management database, it serves to increase the availability and quality of energy management data, such as the master data of generation plants, to reduce the effort involved in reporting such data and at the same time create a high degree of transparency. Commissioning was delayed by about one and a half years.

In addition, the Federal Environment Agency's regional register for electricity from renewable energy sources went online on 1 January 2019.

17 Energy Economy Act – Energiewirtschaftsgesetz as of 7 July 2005 (BGBl. I S. 1970, 3621), latest amendment dated 13 May 2019 (BGBl. I S. 706).

18 Festlegungen.

The register serves to ensure that the regional property of a kWh of electricity generated from renewable energy sources can only be sold once to a consumer.

Involvement of associations as special-interest stakeholders

The political and executive process is subject to the participation of not only market participants, but also many different associations representing the agendas of their respective members. These include, for example, the federal Association of the Energy and Water Industries, the Association of Local Utilities and the German Renewable Energy Federation (BEE). The BEE mainly represents renewable energy-related interests since it is committed to the rapid expansion of renewable energies, and provides arguments and models for the restructuring of the energy supply.

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

i Project finance transaction structures

The typical legal setup for a renewable energy project (utility scale) in Germany does not differ much from the established structures found customarily in all jurisdictions with a developed renewable energy market. The projects are typically owned by special purpose vehicles (SPVs) to allow for single project non-recourse project financing, as well as for single project transactions, by which a project – typically by way of a share transfer in the SPV – is sold to an investor. However, the German market has seen more and more portfolio transactions in recent years where developers have put together portfolios of five, 10 or more renewable energy projects, both existing and under development (also partly with diversified types of energy production, namely solar PV projects together with onshore wind projects), but even in typical portfolio transaction structures, the individual projects are still owned by individual SPVs, which typically have all received individual non-recourse project finance.

Project documentation and administrative requirements

For each renewable energy project (onshore or offshore), the SPV must bring together the necessary paperwork and documentation to evidence full ownership of that project. Some developers choose to have the SPV concerned own the project from the outset, and some tend to transfer project rights to the SPV at a later stage, but in any event when financial close occurs, at the latest, the rights must all be owned by the project SPV. As in practically all other jurisdictions, the necessary paperwork comprises the following.

Engineering, procurement and construction contract or balance-of-plant contract

Each project requires an engineering, procurement and construction (EPC) contract or balance-of-plant contract together with delivery contracts for main components (onshore wind turbines and foundations, offshore wind turbines, pool, foundations; solar PV modules, mounting systems, inverters; and, in all cases, cabling and, as the case may be, separate transformer stations depending on the grid connection situation). The typical onshore setup is characterised by one overall EPC contract, which sometimes even includes main component delivery or is accompanied by one or two separate main component delivery contracts. Single contracting for all different types of works and equipment is rarely seen in onshore projects, but has been used more frequently in the wind offshore segment. In any event, investors and financing banks are well advised to request that delivery of all project

rights (see more specifics below) that might be missing, as well as orderly construction of all interfaces that might otherwise remain unattended to, must be part of the EPC or balance-of-plant obligation.

Operation and maintenance agreements

Operation and maintenance (O&M) agreements are essential in the wind energy sector (with long-term agreements of 15 years or more seen often in the onshore wind energy segment); they are sometimes also relevant in solar PV intallations and obviously so in technically more challenging situations such as utility-scale geothermal plants. In addition, practically every project in Germany comes with agreements on technical and commercial management (in many cases provided by the project developer, who often tends to consider the remuneration for these services to be part of the commercial project package in a transaction).

Land use rights

A very crucial and sensitive issue in German renewable energy practice is the securing of land use rights.[19] As well as the production sites, cable ways to the designated grid connection point (which can be many kilometres away from the production site) have to be secured. For onshore wind energy installations, the rotor blade diameter (in all directions) and distance rights must also be secured, by way of mutual agreement with the land owner concerned, and the accompanying registered rights of use (easements) must be recorded in the relevant land register. In addition, financing banks require separate rights in their favour (see also 'Financing', below), including rights to be recorded in the land register, which makes the marketable and bankable securing of land use rights a very complex task for the project developer.

Permits

Obviously all necessary permits must be secured as part of the administrative requirements. The most relevant permits are the building permit for solar PV, and the permit under the BImSchG[20] for onshore wind, both of which usually comprise all other necessary permits.[21] Offshore wind projects require a permit from the Federal Maritime and Hydrographic Agency and these permits are published on its website.[22]

Grid connection

Another important cornerstone in securing the project paperwork is the grid connection. Grid connection is among the easiest of the administrative requirements to address for offshore projects (although in terms of factual development, grid connection had proven to

19 The requirement for written form criteria for long-term lease agreements under Section 550 German Civil Code and a very diversified jurisprudence on how to cope with that requirement makes long-term lease contracts potentially very susceptible to challenge, which adds to the complexity of the task to secure the land use rights.

20 See footnote 13 above.

21 In individual cases, additional permits might be required, such as permits to use or cross waterways, and specific permits for productions sites in woods. Environmental concerns, specifically concerning bats and birds in the onshore wind segment have increasingly become crucial in wind energy project development. The same applies to sound emissions from wind turbines.

22 https://www.bsh.de/DE/THEMEN/Offshore/Offshore-Vorhaben/offshore-vorhaben_node.html;jsessionid=72BAEFD993645ECEA750C3B4EB9868E8.live21301.

be one of the major obstacles in offshore wind development in Germany some years ago). Project owners for any renewable energy project in Germany have a codified right to receive grid access, the details of which relate mainly to technical issues.

Proof of income

Last, but not least, the project development paperwork needs to prove the securing of income. After fixed feed-in tariffs (and even in the early stages, the combination of direct marketing mechanisms plus a codified market premium, which ultimately amounted to what could, commercially, still be considered a 'tariff'), future projects will have to rely on successful auction bids (for solar PV, these will apply to installations of or greater than 750kWp). A successful bid, however, would still provide 20 years of a secured level of income per kWh.[23] In addition, projects that no longer rely on subsidy mechanisms but are based only on market mechanisms (i.e., on power purchase agreements (PPAs)) have also been seen in the German market and are expected to become more and more popular. Following examples from foreign project developments and project transactions for market-based renewable energy projects, there is currently intense debate in Germany on the various prospects (and risks) of PPA-based projects, and PPAs are expected to play the leading role in renewable energy remuneration in Germany in the future.

Financing

With all the relevant paperwork in place, and construction, commissioning and handover having occurred, the renewable energy project is then (more than) ready for the market. Given the very competitive situation for the acquisition of renewable energy projects on the German market, investors have for a number of years sought to acquire projects in their very early stages, sometimes as 'paperwork-only' deals, thus assuming all, or the remaining, potential construction risk.

In project finance, on the other hand, short-term financing during the construction phase has long been an established part of renewable energy debt financing on the German market and, usually, the same banks that provided interim construction facilities also take over the long-term financing. In terms of commercial requirements, financing banks in project debt financing for renewable energy projects in Germany essentially have the same requirements as typical investors. Long-term debt financing should be regarded as a standard product on the German project finance market, with a duration of approximately 15 years (plus or minus two years depending on the individual case) and a debt financing percentage of 80 to 90 per cent (sometimes even more) of overall project capital expenditure. Often (and more so in the past), such project financing is based on subsidised loan facilities made available by the German state-owned development bank KfW.

The typical security package required by project financing banks in the renewable energy sector includes the following:

a charges or security rights over title to major plant equipment or components;[24]

b assignment of feed-in income or income from electricity sales;

23 Unless the bid expires as a result of late construction, which would be very unlikely to occur.

24 For onshore installations, certain prerequisites have to be observed, mainly in the land use agreement, to ensure that no automatic ownership of the plant equipment by the landlord occurs. For far-shore offshore installations, the granting of security rights may require specific related legal issues to be addressed.

c assignment of warranty claims under component supply and assignment of claims under O&M agreements;

d step-in rights for major project agreements, mainly the major lease agreements, including complementary rights to be registered in the land register and for O&M and asset management contracts; if the construction phase is also financed, step-in rights are also requested for the major component delivery contracts. Typical step-in rights, if drafted accurately, would substitute for otherwise required direct agreements;

e debt service reserve accounts;

f specific reserve accounts for the backing of dismantling guarantees; and

g typical covenants and debt-service coverage ratio requirements, as in any other project finance agreement.

Debt financing for renewable energy projects in the German market is typically provided by project financing banks. There are a large number of banks acting in a nationwide capacity, as well as local institutions who have provided, and continue to provide, debt finance. Debt financing for renewable energy projects, including utility scale, has become a very standard product. Many German banks are also active in financing renewable energy projects outside Germany, mainly in other European countries. On the investment side, many large funds and infrastructure investors can be seen to compete for the acquisition of renewable energy projects, both infrastructure investors from Germany and from abroad. A smaller number of private investors and family offices are also active on the market on occasion.

A market for the purchase of renewable energy has not yet developed fully in Germany as the EEG 2017 framework still provides for reliable long-term fixed income for existing projects, and now also for projects that have successfully won an auction bid. However, PPA structures are the subject of intense debate at present and some quite significant first projects came to the German market in 2018.

ii Distributed and residential renewable energy

Residential solar PV has always played a very strong role in the German market; currently support for small-scale solar PV under the EEG 2017 appears to be stronger than for larger open-field installations of between 0.75 and 10MWp. Residential solar PV can be used both for own consumption and to feed into the grid, and it receives EEG 2017 tariffs for electricity fed into the grid. Business models for immediate consumption of solar PV generated electricity where the installation is not owned by the consumer have developed strongly, but have also faced significant regulatory obstacles and required complex legal and tax issues to be resolved. The EEG 2017 has tried in particular to incentivise landlord-owned solar PV for residential apartment leasehold properties. However, many restrictions apply, inter alia, a rated-power limit of 100kWp for EEG 2017 support.

Nowadays small-scale solar PV is practically always installed together with battery storage applications; at the end of 2018, around 120,000 storage units for solar generated electricity had been installed and in 2018 around 50 per cent of new installations had an accompanying storage unit. Virtual power plants have developed or are under development by combining a large number of decentralised small-scale installations and storage units to form one large flexible provider.

Utility-scale storage projects are increasingly more important on the German market and many projects are in the test phase. Considerably greater use (e.g., for power-to-gas

projects) could be made of available renewable energy that is currently not being fed into the grid for grid-management reasons, if there were stronger support for this in the regulatory framework.

Distributed and residential renewable energy does not play a role in the wind energy sector in Germany.

iii Non-project finance development

Although the typical project finance structures described above are the main source of debt financing for renewable energy projects (and will remain so for the immediate future), some alternative or complementary renewable energy financing measures have been established and are begining to play a more significant role on the German renewable energies market.

One of the first issues that comes to mind when considering alternative renewable energy financing is the issuance of 'green bonds' (i.e., capital market debt instruments specifically for financing renewable energy or other sustainable carbon dioxide reduction projects). However, green bonds in larger quantities or for larger volumes have yet to play a major role in the financing of specific projects or specific project pipelines on the German market. German state-owned development bank KfW, for example, stated in its news feed No. 245 dated 7 March 2019 that although green bonds could be of specific interest for communal municipalities, at the same time: 'However, there are no "true" municipal green bonds in Germany yet, even though Hanover was the first German city with a green and social bond, raising €100 million in capital in 2018.' On the other hand green bonds may serve to refinance other debt or equity financing on the market in quite significant volumes: according to a report issued by the Federal Ministry for Economic Affairs and Energy, as at 2017, Germany was still ranked fourth in the world for the issuance of green bonds, with an offering volume of close to US$10 billion in that year (with France leading significantly in Europe). At the end of 2017, the overall volume of green bonds issued in Germany was approximately US$25 billion (in comparison, France had issued approximately US$42 billion, China US$48 billion and the United States US$80 billion).[25]

The development bank KfW itself issued a €3 billion green bond (demand had totalled €8 billion) with a coupon of only 0.01 per cent in May 2019. Another recent (smaller-scale) example of complementary financing is the offering by local renewable energy provider Hamburg Energie of a 'citizen participation model', connected to a specific wind farm (offering, in essence, a specific savings account with a guaranteed amount of interest).

There have also been smaller-volume green bond offerings on the market in connection with specific projects; for example, to finance or refinance a sponsor's necessary equity contribution, or to finance a further tranche of debt required to allow private persons in the area of a renewable energy project to hold a small share of investment in the project, thereby increasing acceptance of the project with the public. A typical form of such a smaller volume (in the region of one-digit millions of euros) would be profit participation rights as a regulated capital market instrument.

In addition, other new complementary financing schemes, in particular to refinance sponsors' equity contributions, have started developing on the German market, the idea being that the sponsor concerned does not have to sell a project on the market to raise

25 https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-Fokus-Volkswirtschaft/Fokus-2019/Fokus-Nr.-245-Maerz-2019-Green-Bonds.pdf.

the capital for subsequent projects, but can retain ownership of the project and obtain the necessary additional liquidity by way of mezzanine financing instruments, always depending of course on the evaluation of the profitability of the particular project.

V RENEWABLE ENERGY MANUFACTURING

The German market for the manufacturing of main components for renewable energy installations is quite significant in the wind energy sector. As at the end of 2018, roughly 60 per cent of the installed capacity in wind turbine generation in Germany could be credited to wind turbines manufactured in Germany. Of the overall installed capacity in Germany, the most significant German manufacturers had a market share of 42.5 per cent (Enercon), 9.6 per cent (Senvion) and 8.7 per cent (Nordex) respectively, and Siemens Gamesa, based in Spain, had a share of 6.7 per cent.[26] Of the German wind turbine manufacturers, Enercon was listed at number five in the world in 2018, with overall newly installed capacity of 2.5GW, followed by Ming Yang and, at number seven, Nordex with 2.43GW newly installed capacity.

Germany's position in the manufacture of offshore wind turbines is even more significant. At the end of 2017, Siemens' worldwide market share in newly installed offshore capacity was 58 per cent. German manufacturer Senvion (which faced significant commercial difficulty in 2018, and has applied for protective insolvency proceedings) still commands a 3.7 per cent share of the total offshore wind turbines produced worldwide.

There no longer exists any significant solar PV module production in Germany, whereas years ago the country was among the market leaders. However, for components such as inverters or mounting systems, Germany still plays a significant role, with some inverter producers still claiming to be among the market leaders.

No specific tariffs or trade policies apply to the import of renewable energy plant components. Penalty charges on Chinese solar PV modules were lifted years ago.

VI CONCLUSIONS AND OUTLOOK

Germany's impressive development in renewable energy is currently seeing a slowdown in activity, mainly on account of the low volumes of newly installed capacity in wind energy. However, notwithstanding the half-hearted support of the current federal administration for the further development of renewable energy, the market is still active and can be expected to return to full strength in the next few years. Solar PV will (and has already started to) play a stronger role than it did in the past. Given the results of the renewable energy auctions conducted under the German EEG regime so far, reduced prices for produced electricity per kWh will continue to provide full support for market-based projects and the further development of renewable energy PPAs (partly on the basis of the existing practice of direct marketing under the EEG 2017). Renewable energies in Germany have proven able to assume a role in energy production fully equivalent to that played in the past by traditional energy sources. With further grid-related measures and grid enhancement, combined with

26 http://windmonitor.iee.fraunhofer.de/windmonitor_de/3_Onshore/2_technik/7_anlagenhersteller/.

the increased significance of storage facilities, the German market is bringing about big opportunities for achieving successfully the goals of the energy turnaround. New projects and an increased project offering within the coming years may also contribute to reducing, at least slightly, the currently very high level of prices for the acquisition of renewable energy projects in Germany.

Chapter 7

INDONESIA

Kanya Satwika, Tracy Tania, M Insan Pratama and Theodora Saputri[1]

I INTRODUCTION

As the fourth most populous country in the world and the largest economy in South East Asia, Indonesia's energy requirements are considerable and growing, and the country has set a target of achieving electricity generation capacity of 56,395MW by 2028,[2] which includes accelerated development of the power generation programme (35,000MW).[3] Although the majority of energy resources would predominantly continue to be derived from fossil fuels, there remains room for renewable energy sources to grow, and the PLN Electricity Plan 2019 suggests that the renewable energy sources sector will increase its portion of the national energy mix to 23 per cent by the end of 2025.[4] Based on Indonesia's broader master plan, the government expects that by 2050 the use of renewable energy for power will increase to 31 per cent.[5]

The most developed renewable energies are hydropower and geothermal energy, with a total installed capacity of 5,024MW and 1,403.5MW respectively.[6] These figures, however, are low in comparison with its total potential. In 2015, the development of renewable energy only reached 2 per cent of the total potential renewable energy sources in Indonesia.[7] Despite attempts to broaden the offtaker base, PT Perusahaan Listrik Negara (Persero) (PLN) is, de facto, the sole offtaker in Indonesia, and independent power producers (IPPs) are required to sign a power purchase agreement (PPA) with PLN under a tariff approved by the government.

The following may have contributed to hindering potential investment in the development of renewable energy:

a fuel subsidies;

b legal uncertainties;

c a lack of incentives for the use of renewable energy;

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2 Minister of Energy and Mineral Resources Decree No. 39 K/20/MEM/2019 on the Ratification of PT PLN Electricity Generation Plan 2019–2028 (the PLN Electricity Plan 2019).

3 Presidential Regulation No. 4 of 2016 on Acceleration of the Development of Electricity Infrastructure (PR 4/2016).

4 PLN Electricity Plan 2019, page III-7.

5 National Energy Master Plan (RUEN) for 2015 to 2050 as stipulated in Presidential Regulation No. 22 of 2017, page 20.

6 Indonesia Energy Outlook 2016, https://www.esdm.go.id/assets/media/content/outlook_energi_indonesia_2016_opt.pdf.

7 RUEN, page 20.

d a land acquisition backlog;
e issues associated with the use of forestry areas for the development of renewable energy;[8] and
f a new mechanism for the determination of Basic Production Prices as stipulated in MEMR 50/2017, as amended (see Section III.ii).

In spite of the government's commitment to optimising the development of renewable energy, there remain questions on how these issues would be addressed.

II THE YEAR IN REVIEW

PLN's electricity plan for 2019–2028, which has been approved by the Minister of Energy and Mineral Resources (MEMR), suggests projected average growth in electricity demand of 6.42 per cent. Significant capacity growth, from 1,200MW to 2,000MW, is expected for wind and solar sources. PLN is considering approximately 1,000 locations for new solar photovoltaic (PV) and wind farms to be built between 2019 and 2028 across Sumatra, Java, South Sulawesi, Nusa Tenggara, Maluku and Madura. For solar power plants, PLN acknowledges that development of rooftop solar PV power systems may help the government increase the proportion of renewable sources in the national energy mix to 23 per cent by the end of 2025.

In 2018 and early 2019, the government issued the following regulations in the energy sector:

a MEMR 10/2018, which is a second amendment to MEMR 10/2017, stipulating that under PPAs only natural disasters are considered force majeure events (under the former regulation, changes in laws and regulations were also considered force majeure events and the cost impact for IPPs was passed on to PLN as a tariff increase or, where a power plant could not be operated because of governmental force majeure (GFM) events, the IPP would be exempted from its obligations);[9]
b MEMR 53/2018, which is an amendment to MEMR 50/2017, adding liquid biofuels as a new type of renewable energy that may be purchased by PLN (see Section III.ii);[10]
c MEMR 49/2018, which sets out the procedure for the use of rooftop solar-panel power systems by PLN customers;[11]

8 RUEN, page 13.

9 MEMR Regulation No. 10 of 2018 concerning the second Amendment to Regulation of the Minister of Energy and Mineral Resources No. 10 of 2017 on Main Provisions for Power-Purchase Agreements.

10 MEMR Regulation No. 53 of 2018 concerning Amendment to Regulation of the Minister of Energy and Mineral Resources No. 50 of 2017 on the Utilisation of Renewable-Energy Resources for the Production of Electricity.

11 MEMR Regulation No. 49 of 2018 concerning the Utilisation of Rooftop Solar Power Systems by Customers of PT PLN (Persero).

d MEMR 39/2018, which aims to integrate the electricity sector into the online single submission (OSS) system and sets out several provisions addressing reclassification of licences, licensing procedure, supervision and transitional provision (see Section III.ii);[12]

e MEMR 37/2018, which sets out the procedure for securing geothermal licences.[13]

These new regulations have not addressed or removed the challenges posed to new IPPs as a result of the regulations issued in 2017, which introduced more government controls that may affect the bankability of power projects, including those using renewable energy as power sources (see Section III.ii).

III THE POLICY AND REGULATORY FRAMEWORK

i The policy background

To balance the government's ambition to achieve a 35,000MW electricity capacity while increasing the proportion of renewable sources in the energy mix, the government has introduced several incentives to IPPs that develop renewable energy sources, namely:

a a possible exemption by the Bank of Indonesia on the mandatory use of the rupiah for power plant projects as strategic infrastructure projects;[14]

b tax incentives provided for renewable energy power generation projects, including solar, wind, ocean and hydropower,[15] and covering:
- income tax deductions in an amount of 5 per cent per year for six years;
- lower tariffs for income tax on dividends paid to non-resident taxpayers;
- an extended tax loss carry-forward period of up to 10 years;
- accelerated depreciation on tangible assets; and
- accelerated amortisation of intangible assets;[16]

c IPPs may be granted a 2.5 per cent customs duty exemption for the import of capital goods used in energy development projects;[17]

d the possibility to acquire government guarantees for power plant projects,[18] which is discussed further in Section IV; and

e the OSS system, which allows IPPs applying for an electricity supply business licence (IUPTL) to automatically obtain a conditional IUPTL after stating their commitment to fulfilling all the requirements set by the government (see Section III.ii).[19]

12 MEMR Regulation No. 39 of 2018 concerning Electronically Integrated Business Licensing Services for the Electricity Sector (MEMR 39/2018).

13 MEMR Regulation No. 37 of 2018 concerning the Offering of Geothermal Working Areas, the Issuance of Geothermal Licences and the Assignment of Geothermal Businesses.

14 Regulation of Bank Indonesia No. 17/3/PBI/2015 regarding Mandatory Use of Rupiah in the Republic of Indonesia.

15 Government Regulation No. 18 of 2015 concerning Income Tax Facilities for Capital Investment in Certain Business Sectors and/or Certain Regions (GR 18/2015), Schedule I Point 60.

16 GR 18/2015, Article 2(2).

17 BKPM 13/2017, Article 60.

18 Minister of Finance Regulation No. 130/PMK.08/2016 on the Procedure of Granting of Government Guarantee for the Acceleration of Electricity Infrastructure Development (MOF 130/2016).

19 MEMR 39/2018.

ii The regulatory framework

Electricity generation from renewable sources is mainly governed by the Energy Law, the Electricity Law,[20] the Investment Law,[21] and other sectoral and implementing regulations in the areas of geothermal, water, environment and forestry. In addition, IPPs and lenders must also comply with the applicable laws in relation to offshore loans and the mandatory use of the rupiah.

Electricity supply business licences

For IPPs to generate electricity and deliver it to PLN, they are required to obtain an IUPTL issued by the government to control the IPP's technical and financial capability, and fulfil environmental protection requirements.[22] To simplify bureaucracy, IUPTL applications are pooled by and submitted to BKPM, which is currently operating the OSS system.[23] The OSS system is an integrated licensing system for the processing of business licences for and on behalf of ministries, heads of agencies, governors, regents and mayors. MEMR 39/2018 reclassifies business licensing within the electricity sector into business licences, and commercial and operational licences. An IUPTL is considered a business licence and a certificate of operational worthiness constitutes a commercial and operational licence. To obtain an IUPTL and a certificate of operational worthiness, an IPP is only required to secure a Business Identity Number (NIB) through the OSS system. After securing the NIB, the IPP must submit its applications for licences through the OSS system. Licences will then be issued subject to the IPP meeting certain obligations. For an IUPTL, an IPP is required to submit documents proving it has met these obligations within 25 days of the issuance of the IUPTL. The documentary requirements include an electricity generation feasibility study, details of the project's proposed location, construction and operation schedules, and a PPA with PLN demonstrating the IPP's technical, financial and environmental protection capabilities.

Geothermal licences

The regulatory regime with respect to geothermal business activity is divided into two regulatory regimes: the old regulatory regime applicable prior to 2003 and the new regulatory regime applicable after 2003.

Prior to the issuance of the geothermal law in 2003, Pertamina was appointed by the government as the sole geothermal mining authority in Indonesia.[24] Pertamina has the exclusive right to undertake geothermal business activities in work areas stipulated by the government by implementing its own operations or appointing a contractor pursuant to a joint operation contract (JOC). The JOC sits back-to-back with an energy sales contract (ESC) between the contractor as the deliverer of the geothermal energy or electricity produced, Pertamina as the seller and PLN as the buyer.

20 Law No. 30 of 2009 concerning Electricity.

21 Law No. 25 of 2007 on Investment.

22 Government Regulation No. 14 of 2012 on Electricity Generation Business.

23 MEMR Regulation No. 35 of 2014 on the Delegation of Authority to Issue Licences in Electricity Sectors for the Implementation of One-Stop Integrated Services, as last amended by Regulation of Minister of Energy and Mineral Resources No. 14 of 2017.

24 Perusahaan Pertambahan Minyak dan Gas Bumi Negara now PT Pertamina (Persero) (Pertamina). Pertamina's geothermal business and role under the old geothermal regimes was then assigned to its wholly owned subsidiary, PT Pertamina Geothermal Energy.

Following the enactment of the geothermal law in 2003,[25] geothermal business activity is implemented by virtue of a geothermal licence issued by the government following tenders for work areas. Notwithstanding the foregoing, all JOCs and ESCs entered into prior to the enactment of the geothermal laws in 2003 remain valid until the end of their terms. In 2014, the government introduced a new law to better manage geothermal energy. The 2014 Geothermal Law established the distinction that geothermal activities are not part of mining activities.[26] Consequently, geothermal activities in production forests and protected forest areas, which is where most of Indonesia's geothermal resources are concentrated, are permitted by obtaining a 'borrow-and-use' permit for forest areas (see Section III.ii, 'Forestry issues', below).

To undertake geothermal activities, the IPP must participate in a public bid process to obtain the rights to manage and operate a geothermal working area. Pursuant to MEMR 37/2018, geothermal working areas are required to be publicly offered through the implementation of a two-tiered tender mechanism: (1) determination of qualified tender participants according to various administrative, technical and financial criteria, and (2) appointment of the winning bidder, who will be granted the rights to manage and operate a geothermal working area and geothermal licence by the MEMR.

Procurement process for renewable energy PPAs

PLN in general is required to purchase electricity produced from renewable energy if the following requirements are met:

a the electricity generation is in line with PLN's local grid supply–demand balance;
b a feasibility and connectivity study has been conducted and verified by PLN;
c funding is available; and
d the pricing of the electricity is consistent with MEMR 50/2017 (see 'Electricity tariff for renewable power generation projects', below).

For renewable energy projects, PLN may appoint an IPP by way of direct selection or direct appointment, depending on the type of renewable energy in question, as follows.[27]

Power source	Procurement process
Solar PV	Direct selection based on a quota of capacity
Wind	Direct selection based on a quota of capacity
Hydro	Direct selection
Biomass	Direct selection
Biogas	Direct selection
Municipal waste	Direct appointment

25 Law No. 21 of 2003 as amended by Law No. 21 of 2014 on Geothermal (the Geothermal Law) and Government Regulation No. 59 of 2007 regarding geothermal business activity (GR 29/2007).

26 The Geothermal Law.

27 MEMR Regulation No. 001 of 2006 on the Procedure to Purchase Electricity and/or to Lease Electricity Grid for Public Interest Purposes, as amended by MEMR Regulation No. 004 of 2007. Specifically, for renewable energy, the procurement process may be carried out by way of direct selection or direct appointment as provided under MEMR Regulation No. 50 of 2017 on the Use of Renewable Energy for Electricity Supply, as amended by MEMR Regulation No. 53 of 2018 (MEMR 50/2017).

Power source	Procurement process
Geothermal	Direct appointment
Ocean tidal or thermal	Direct selection

The direct appointment process involves the appointment of one specific IPP, whereas direct selection involves the selection of more than one potential IPP. The MEMR's approval is required to initiate the direct appointment and direct selection processes.

Terms and conditions for PPAs

Until recently, the provision of PPAs was mostly based on business-to-business negotiations between an IPP and PLN. In 2017, however, the government issued MEMR 10/2017 to 'lock down' certain provisions of PPAs.[28] This regulation may reduce the time required to negotiate the terms of a PPA, but at the same time may prejudice the general bankability of a PPA (i.e., through provisions regarding risk allocation, deemed capacity payment and GFM events).

MEMR 10/2017 is widely applicable to most types of power plant with the exception of intermittent power plants and certain renewable energy power plants, namely biogas, mini hydropower plants below 10MW and municipal waste-based power plants. Other renewable energy plants, such as geothermal, hydropower and biomass plants, remain subject to this regulation.

The key provisions regarding PPAs based on MEMR 10/2017 (including its subsequent amendments) and recent PPA precedent in the areas of renewable energy are as follows.

Key terms	Remarks
Term	Maximum of 30 years as of the commercial operation date (COD)
Scheme	Build, own, operate and transfer (BOOT)
Deemed dispatch	Limited only if PLN's grid is interrupted or unable to take the net electrical output because of PLN's default or negligence
GFM	References to GFM are omitted from the most recent regulation (i.e., MEMR 10/2018)
Price review	Limited to changes of cost structures or changes to the technical details of a project. A change in cost structure is defined as a change in laws in the following areas: • regulations related to electricity prices; • taxation; • environment; and • regulations related to energy cost
PLN take-or-pay	Limited to a certain period agreed by the parties and in consideration of the repayment term to an IPP's lenders
Penalty payable to PLN	• Penalty for failure to meet the COD schedule • Penalty in respect of availability factor or capacity factor, and outage factor • Penalty in respect of IPP's failure to cope with PLN's megavolt ampere reactive interconnection system, except if the failure is due to a PLN request • Penalty for failure to maintain frequency required by the electrical grid system (grid code) • Penalty for failure to meet the required ramp rate
Remedy for PLN default or GFM	PLN is required to purchase the project with consideration of the equity injected, the equity return rate, and senior debt and interest

28 MEMR Regulation No. 10 of 2017 concerning Principles of Power Purchase Agreement, as amended by MEMR Regulation No. 49 of 2017 and MEMR Regulation No. 10 of 2018.

Electricity tariff for renewable power generation projects

The general pricing guidelines under MEMR 50/2017[29] for renewable power generation projects are benchmarked against PLN's average electricity generation basic cost for the preceding year in the area where that project is to be located (the generating BPP).[30] The electricity tariffs for renewable power generation projects are as follows.

Power sources	Calculating the electricity tariff
Solar PV	If the generating BPP is higher than the national average, then the tariff may not exceed 85 per cent of the generating BPP If the generating BPP is lower or the same as the national average, then the electricity purchase price will be determined by mutual agreement between the IPP and PLN on a business-to-business basis
Wind farm	
Biomass	
Biogas	
Ocean tidal or thermal	
Hydro	If the generating BPP is higher than the national average, then the tariff under the PPA may not exceed the generating BPP If the BPP of the Sumatra, Java and Bali areas or the relevant generating BPP is lower than or the same as the national average, then the electricity purchase price will be determined by mutual agreement between the IPP and PLN on a business-to-business basis
Biofuel	The electricity tariff must be based on agreements made between the relevant parties

The national average generating BPP for the period from 1 April 2019 to 31 March 2020 is US$7.86 cent/kWh.[31]

For obvious commercial reasons, PLN intends to lower or at least maintain the generating BPP. Benchmarking the electricity tariffs to the generating BPPs will affect investors' appetite to develop renewable power generation projects, because the low generating BPPs in most of the relevant areas are the result of Indonesia's principal reliance on coal-fired power plants, which are not comparable for the calculation of renewable power generation prices.

Supervision by the MEMR

Under MEMR 48/2017,[32] the MEMR exercises supervisory authority over IPPs in several areas, including regarding share transfer restrictions, and notification requirements for changes in shareholdings and in the composition of the board of directors and board of commissioners of an IPP. The share transfer restrictions have created some concerns over the bankability IPP projects.

Environmental matters

Pursuant to the Environmental Law,[33] business entities carrying out operational activities with significant impact on the environment are required to prepare an environmental impact assessment (AMDAL) that has to be approved as a prerequisite to secure an environmental

29 MEMR 50/2017.

30 Biaya Pokok Penyediaan Pembangkitan.

31 MEMR Decree No. 55 K/20/MEM/2019 concerning PLN's Average Electricity Generation Basic Cost for the Year 2018.

32 MEMR Regulation No. 48 of 2017 concerning Supervision in the Energy and Mineral Resources Sector.

33 Law No. 32 of 2009 regarding Environmental Protection and Management and Government Regulation No. 27 of 2012 regarding Environmental Permits.

permit. Where an AMDAL is not required, companies shall annually submit environmental management and environmental control effort reports to be approved by the authorised government institution.

Forestry issues

Indonesia's forests are arranged in three different classifications depending on their nature and functionality: production forests, protected forests and conservation forests. To use production and protected forests for commercial activities, including for the development of power plants, and the transmission and distribution of power supplies, a borrow-and-use permit must be obtained from the Minister of Environment and Forestry (MOEF) through the OSS system.[34] The Forestry Law in general prohibits commercial activities within conservation forest areas to protect their pristine nature. However, geothermal activities may be implemented within nature-reserve forest areas after securing a geothermal environmental services utilisation permit issued by MOEF. There is currently no legal framework available to secure access to conservation forests and hunting parks.

Land matters

Under the Agrarian Law,[35] the state holds ultimate title to all land in Indonesia. To construct a power plant (except in a forestry area), IPPs must first secure a land title in the form of a building right. Prior to acquiring any land title with a total area of more than 10,000 square metres, IPPs must obtain a location permit, as well as a permit to conduct land acquisition within the framework of investment and to use the land for operational activities, from the relevant authority, which depends on the location of the land.

To mitigate project risks due to land acquisition, the government provides a legal framework for the mandatory acquisition of land, including for electricity infrastructure development, if this is in the public interest.[36] Such land acquisition is undertaken through the state budget. Accordingly, any land title subject to such acquisition must be transferred from the relevant landowner to the government, in this case to the National Land Agency (BPN). IPPs may be required to assist in the land acquisition process, and may have a use right over the land, but will not be entitled to register the land under their name.

In addition to land for power plants, IPPs may also be required to acquire a right of way for a transmission line to traverse the conductors from power plants to PLN interconnection points (where power plants and PLN's grid system are connected). Transmission lines and interconnection points are commonly referred to as 'special facilities'. Based on PPA precedents, IPPs are required to construct these special facilities and transfer their title to PLN on or before the COD. Thus, IPPs may not place any encumbrances over special facilities.

34 Law No. 41 of 1999 regarding Forestry, as amended by Law No. 19 of 2004 and partly revoked by Law No. 18 of 2013), MOEF Regulation No. P.50/Menlhk/Setjen/Kum.1/6/2016, as revoked by MOEF Regulation No. P.27/Menlhk/Setjen/Kum.1/7/2018.

35 Law No. 5 of 1960 on the Principles of Agrarian.

36 Law No. 2 of 2012 on Land Procurement for Public Interest Development and Presidential Regulation No. 71 of 2012 on the Implementation of Land Procurement for Public Interest Development, as amended from time to time).

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

i Project finance transaction structures

Transactional structure

Project financing for the development and implementation of renewable energy projects is generally similar to those for other infrastructure projects. A typical project finance in Indonesia is structured through a combination of the sponsor's equity and senior debt secured by the entire project's assets, including cash flow, with limited recourse against the project's sponsors. The project company shall be in the form of an Indonesian limited liability company established especially to own and manage the project, and in most cases it is a joint venture between a local sponsor and an international sponsor who participate in the construction and management of the project.

As mentioned above, the BOOT scheme must be used for energy projects. Aside from BOOT, the build, own, operate model has also been used in the past for several geothermal and hydro projects. The project company will then enter into an electricity offtake agreement in the form of a PPA with PLN. During the PPA period, the project company will own all project assets and enter into all agreements relating to the project. Under the BOOT scheme, following the expiry of the PPA, termination of the PPA due to PLN's default or GFM, the project company shall be transferred to PLN. In the case of termination because of PLN defaulting or GFM, PLN is required to purchase the project according to a predetermined price structure: see Section III.ii.

Project finance lenders in Indonesia are mainly international commercial banks, multilateral development agencies such as the Asian Development Bank (ADB), and export credit agencies (ECAs) such as Korean Exim Bank, China Exim Bank and JBIC. Typically, ECAs from the international sponsor's jurisdiction will be involved in providing financing, particularly if the international sponsor is also the project's contractor. It is difficult for local banks to provide project financing because of their limited liquidity for long-term debt and the lack of a derivatives market.

In the past 10 years, PT Sarana Multi Infrastruktur (Persero) (SMI), a state-owned infrastructure financing company, and PT Indonesia Infrastructure Finance (IIF), a joint venture between the government (through SMI), ADB, International Finance Corporation, Deutsche Investitions-und-Entwicklungsgesellschaft and Sumitomo-Mitsubishi Banking Corporation, have also been actively providing project financing for infrastructure projects in Indonesia, including renewable energy projects. Both SMI and IIF were established by the government as part of its efforts to accelerate infrastructure developments by providing domestic finance in the form of debt and equity. In 2015, SMI was mandated by the government to manage the state budget allocated specifically to fund geothermal projects.

Documentation

Project documents

Aside from the PPA, the key project documents in renewable energy projects typically include:

a engineering, procurement and construction (EPC) contracts;
b operation and maintenance (O&M) contracts;
c service agreements;
d government support agreements (if provided);
e sponsors' agreements;

f bank guarantees; and
g performance guarantees.

Construction contracts must be executed in compliance with the Construction Law,[37] which, inter alia, sets out the minimum key terms of the contract and the mandatory use of the Indonesian language. Further, a tripartite converting agreement between an IPP, PLN and designated state-owned bank regulates the conversion of Indonesian rupiah payments for power purchased by PLN into US dollars at the prevailing exchange rate to comply with the mandatory use of the rupiah.

Finance documents

In a typical project financing, the financing documents include:

a facility agreements;
b sponsor support agreements;
c inter-creditor agreements;
d direct agreements;
e hedging agreements; and
f security documents.

These are discussed in further detail below.

For transactions that combine different types of financial institutions or granted facilities, a common terms agreement is typically executed to govern the principal terms of the financing, with a separate facility agreement for each creditor or facility. Indonesian law does not provide for any standard form of financing documents (save for security documents in certain cases), and they will generally be in such a form as is acceptable to the market.

Security in project finance transactions in Indonesia covers all the project's assets owned by the project company. Certain assets used as special facilities for the project will be transferred to, owned and operated by PLN once constructed, and thus will not be included in the security package. The security taken by the lenders is generally as follows:

a a pledge over the shares in the IPP project company;
b a mortgage over immovable assets (i.e., land and buildings);
c *fiducia* security over movable assets, receivables derived from the PPA, insurance and reinsurance claims, and buildings or fixtures;
d a pledge over the project's accounts; and
e conditional novation over project documents, including the PPA, EPC agreements, O&M agreements, bank guarantees and performance guarantees.

In addition to this security, a lender will also usually require a direct agreement to be executed, to allow it to have step-in rights into the main project documents, so that the lender may replace a project company in the documents when it exercises its rights thereunder.

37 Law No. 2 of 2017 on Construction Services.

Government support for the development of electricity infrastructure

Public–private partnerships

In early 2015, the government issued a regulation framework to boost public–private partnerships (PPPs) in the procurement and development of essential infrastructure projects in Indonesia.[38] Under the new regulation, PR 38/2015, the number of sectors allowed to use PPPs has expanded from nine to 19, with the addition of, among others, renewable energy, water resources, waste management and energy conservation. Foreign and local investors are now allowed to participate in tender processes directly without establishing a company in Indonesia. Once an investor has been selected, it should establish a project company in Indonesia to implement and execute the PPP.

PR 38/2015 also addresses land procurement issues. PR 38/2015 makes land procurement the government's responsibility, and sets out a clearer procedure and timeline for investors. A tender process may not commence until the government obtains a site determination from the relevant provincial governor: thus, a project's site will be final from the outset. Under PR 38/2015, the government may now also place the land procurement process in the hands of a private sector partner to act on its behalf through a special power of attorney, which gives the private entity more room to operate.

Government guarantees for PPP projects have a key role to play in encouraging investment in the infrastructure sector. The government may now provide guarantees on political and sub-sovereign risks that can, for example, ensure the continuity of a PPP project despite a change in government, and assure the deliverables made by a regional public sector authority. The possibility of government support in the form of tax incentives and fiscal contributions should also help to improve the attractiveness of PPP projects, thereby potentially resulting in more competitive bids from the private sector. Partial financing and viability support for PPP projects of social interest and public benefit in relation to the construction of new infrastructure, or the operation and maintenance of infrastructure, should also help boost private investor interest.

PR 38/2015 provides greater assurances with respect to land procurement, and greater government support to make the sectors using PPPs more attractive to investors. However, very few renewable energy projects have been funded through PPPs to date. Pursuant to the 2018 PPP Handbook, 15 PPP projects were ready to be offered in 2018, but none of them were renewable energy projects.[39]

Business viability guarantee from the government for electricity infrastructure

In addition to government support and government guarantees for PPP projects, the government may issue a guarantee to investors for power generation projects.[40] The government guarantee may include a business viability guarantee letter (BVGL).

BVGLs are granted to IPPs to secure PLN's financial obligations under a PPA, which consist of the payment of the electricity price and other payment obligations. PLN's financial obligation shall be limited to other payment obligations arising from the occurrence of

38 The President issued Regulation No. 38 (PR 38/2015) revoking its predecessor, Regulation No. 13 of 2010 on Cooperation between the Government and Business Entities in Infrastructure Provision.

39 https://www.bappenas.go.id/files/PPP%20Book/PPP%20Book%202018%20FINAL.pdf.

40 MOF 130/2016.

political risks, such as government actions and inaction or a change in law, which must be borne by PLN, or any other PLN non-remediable event as stipulated in the PPA. BVGLs will be signed by the MOF and issued to IPPs with a copy going to PLN.

We understand from previous experience that the obligations of the government under a BVGL constitute obligations under Article 1316 of the Indonesian Civil Code. The clause is essentially an indemnity provision, allowing the indemnified party to claim for the indemnified amount directly from the indemnifying party. Thus, an IPP could make a claim directly against the government under a BVGL. However, MOF 130/2016 requires the payment to go to PLN first, rather than directly to an IPP. After PLN receives the amount, PLN should pay that amount to the relevant IPP; however, this system has yet to be implemented.

ii Distributed and residential renewable energy

To achieve the government's commitment of 23 per cent utilisation of renewable energy, the MEMR encourages domestic households to adopt rooftop solar PV power systems. PLN customers who are interested in using solar-panel systems are required to follow the procedure set out under MEMR 49/2018: (1) application has to be made for the installation of a solar-panel system to the general manager of PLN, with copies to the Directorate General of Electricity and the Directorate General of New and Renewable Energy; (2) PLN then assesses the application; and (3) after approval is granted by PLN, customers may commence installation of the solar-panel system. Note that the installation of rooftop solar systems should only be undertaken by certified companies, which are those companies that have fulfilled the technical requirements set out by the MEMR and that have obtained (1) a business certificate from the Business Entity Certification Agency and (2) an Electricity Support Services Business Licence from the Directorate General of Electricity of the MEMR.[41]

If the amount of electricity exported from the customer's solar-panel system is greater than the amount of electricity imported in the current month, the excess shall be collected and calculated as a deduction from the customer's electricity bill for the following month. The installation of rooftop solar PV equipment is also subject to the local content requirement (see Section V).

V RENEWABLE ENERGY MANUFACTURING

The Electricity Law requires IPPs to prioritise the use of domestic products in developing power generation projects, including renewable energy projects. The government requires IPPs to comply with minimum local content requirements (for goods and services) for the development of electricity infrastructure.[42] Failure to comply with these local content requirements may result in administrative and financial sanctions.

41 MEMR Regulation No. 35 of 2013 on Procedures on Electricity Business Licensing, as amended by MEMR Regulation No. 12 of 2016.

42 Minister of Industry Regulation No. 54 of 2012 on the Local Content for Electricity Infrastructure (as amended by Regulation No. 5 of 2017).

VI CONCLUSIONS AND OUTLOOK

In spite of the recent correction to Indonesia's energy outlook (see Section II), the renewable energy sector's share of the energy mix is still expected to grow. However, the government's latest regulation spree in 2017 may prove counterproductive in relation to the promotion of new renewable projects; for example, by limiting electricity tariffs to the BPP, the imbalance in risk allocation in PPAs between PLN and IPPs, and the stringent supervision of the MEMR in the energy sector.

On the other hand, in 2018 the government launched the OSS system with a view to accelerating licence processing. The OSS system will be able to process, in one place and very expeditiously, business licences across almost all sectors. The new licensing procedure bypasses regional bureaucracies and ultimately simplifies processing requirements. The fulfilment of the relevant licensing requirements is to be undertaken after businesses have secured their business licences.

Chapter 8

ITALY

Marco D'Ostuni, Luciana Bellia, Riccardo Tremolada and Giuliana D'Andrea[1]

I INTRODUCTION

Over the past decade, there has been a substantial increase in renewable energy projects in Italy, resulting in the use of more renewable energy sources (RES) in all sectors. At the same time, factors such as the economic recession, the enhancement of energy efficiency and particularly favourable climatic conditions have led to a reduction in energy consumption.[2]

The shrinkage of consumption, in conjunction with the increase in RES, is expected to have a significant impact on the reduction of the country's high rate of energy dependency on foreign countries (83 per cent, compared to the European average of 55 per cent[3]) and, consequently, lead to improvements in energy security and diversification. The expansion of RES also represents a significant driving force for the country's industrial supply chain, offering tangible opportunities for industrial growth and launching new enterprises capable of promoting the competitiveness of the national economy.

The share of RES in the Italian energy mix has more than doubled in the past decade, outpacing the EU[4] and Italian governments'[5] RES targets for 2020. However, to ensure that 2030 targets are met, efforts must be increased.[6]

The Italian government has supported renewable energy projects with a range of economic incentive schemes that have simplified administrative procedures for the construction and operation of RES plants (e.g., green certificates) and have favoured RES plants over traditional thermoelectric plants in many respects (e.g., priority dispatch).The generous incentive system led to an unprecedented level of development in renewable energy projects in Italy between 2010 and 2013,[7] especially with respect to photovoltaic power. Following this development, the Italian government reduced direct economic incentives,[8]

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2 SRM, MED & Italian Energy Report, March 2019, p. 75.

3 ibid., p. 93.

4 See Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources, OJL 140, pp. 16–62.

5 Under Directive 2009/28/EC, the Italian legislature set a target renewable energy sources (RES) share of 17 per cent of the energy mix by 2020. See also Italy's Fourth Progress Report under Directive 2009/28/EC, December 2017.

6 European Commission, Fourth Report on the State of the Energy Union COM (2019) 175.

7 ARERA, Report No. 428/2018/I/efr of 2 August 2018, p. 10, table 3.

8 In particular, feed-in tariffs are no longer available for RES plants that commenced activities after 31 December 2012 (see Section III.i).

and the development of non-programmable RES – and photovoltaics in particular – seems to have stabilised.[9] In contrast, the growth of wind farms, while still significant, has been much more linear over time.[10]

In 2018, Italy's RES installed capacity amounted to approximately 1.162MW, corresponding to a 28 per cent increase from 2017. This growth can primarily be attributed to the advancement of the wind power sector, especially during the final quarter of 2018. Overall, in 2018, RES plants generated more than 54GW in power, accounting for about 45 per cent (or approximately 118GW) of the gross Italian energy production.[11] Of that 45 per cent, wind power accounted for 511MW of new installed capacity, taking the lead for the first time from the photovoltaic sector, where capacity amounted to 437MW. As a whole, non-programmable RES recorded greater growth in 2018 than in 2017, particularly because of the increased role of the wind power sector. Additionally, hydroelectric power and bioenergy also recorded a slight increase in new installations, with capacities of 140MW and 74MW respectively.[12]

The territorial distribution of RES production remains heavily influenced by the presence of hydroelectric plants in the northern regions of Italy. On the other hand, the south, which holds a competitive advantage over the centre–north because of morphological, orographic and climatic characteristics,[13] contributes 96.7 per cent and 42.9 per cent of the country's total electricity production from wind and solar power respectively.[14]

While there has been a recent trend towards recourse debt financing by issuing green bonds, major transactions in the renewable energy sector typically involve project financing schemes.

Energy service companies (ESCOs) play an important role in promoting small generation projects, usually through contracting schemes that indemnify small customers against financial risks related to such projects.

II THE YEAR IN REVIEW

Key legislative developments in the renewable energy sector in the second half of 2018 and the first half of 2019 included the following:

a Law No. 145/2018 (the 2019 Budget Law), which extended tax deduction for expenses relating to energy-efficient renovation of buildings[15] to 31 December 2019 and provided for incentives for biogas power plants for electric power generation with power equal to or less than 300kW;[16]

b Ministerial Decree of 2 March 2018 (the Biomethane Decree), which introduced a support scheme for biomethane injected into the natural gas grid and for advanced biofuels to be used in the transport sector. The Biomethane Decree applies to

9 ARERA, Report No. 428/2018/I/efr of 2 August 2018, p. 10.

10 ibid.

11 Energy & Strategy Group, Renewable Energy Report, May 2019, p. 53.

12 ibid., p. 54.

13 SRM, MED & Italian Energy Report, March 2019, p. 86.

14 GSE, Rapporto Statistico, Energia da fonti rinnovabili in Italia, February 2019.

15 Law No. 145/2018 (the 2019 Budget Law), Article 1, Paragraph 67(a).

16 ibid., Article 1, Paragraph 954 (correlatively, on 15 March 2019, the Energy Services Manager (GSE) published an addendum to the implementing regulations of the Ministerial Decree of 23 June 2016 to include the provisions of the 2019 Budget Law on biomass incentives).

(1) production plants starting operations between 2018 and 2022; (2) existing plants already qualified or in the process of being qualified, pursuant to the Ministerial Decree of 5 December 2013, upon request to the Energy Services Manager (GSE) within 30 days of the entry into force of the Biomethane Decree; and (3) existing plants for the production of biogas that is converted, partially or totally, in plants for the production of advanced biomethane between 2018 and 2022. The incentive mechanism is based on the obligation for producers of gasoline and diesel also to supply a minimum quantity of biofuels;

c Italian Regulatory Authority for Energy, Networks and the Environment (ARERA) Resolution No. 27/2019/R/gas of 29 January 2019, updating the rules governing the connection of biomethane plants to natural-gas networks, as previously defined by Resolution No. 46/2015/R/gas, which implements the Ministerial Decree of 2 March 2018 on incentives for the production of biomethane;

d Law No. 12 of 11 February 2019, which converted into law Decree Law No. 135 of 14 December 2018, which provided that hydroelectric concessions, upon expiration and in cases of forfeiture or renunciation, shall pass, without compensation, into the property of the regions;[17] and

e the draft Renewables Decree, as amended (the RES1 Decree), governing the public support scheme for RES, covering the three-year period until 2021. The RES1 Decree was approved in March 2018 by the Ministry of Economic Development (MSE). However, the draft is still subject to approval by the European Commission. The RES1 Decree aims to promote the deployment of clean energy power plants in the following categories: (1) wind and photovoltaic plants, and photovoltaic plants where the relevant modules have been installed to replace Eternit or asbestos roofs; (2) hydroelectric, geothermal and gas-powered plants; and (3) wind, hydroelectric, geothermal and gas-powered plants subject to partial or total revamping. Access to the incentives will either be by registration in registers or participation in competitive reverse-bid auctions via eight different tenders. Given that the first round of registration and auctions was expected to launch on 31 January 2019, it can realistically be expected to occur after the summer of 2019, and will be followed by a new round every four months. The draft also mentions the possibility of setting up a platform for the negotiation of long-term power purchase agreements (PPAs).

Key corporate transactions in the renewable energy sector in the past year included the following:

a on 25 February 2019, major Italian oil and gas company Eni SpA began construction of a 31MWp solar power plant at the Porto Torres industrial site in Sassari, Sardinia. The plant is expected to be completed by the end of 2019;

b on 16 January 2019, German wind turbine manufacturer Senvion SA was contracted by Repower Renewable to equip a 6MW wind park on the island of Sardinia, supplying turbines that will have the largest rotor diameter in Italy;

17 Law No. 12 of 11 February 2019, Article 11 *quater* concerning 'Provisions on concessions for large hydroelectric derivations' contains important amendments to Article 12 of Legislative Decree No. 1999 of 16 March 1999.

c on 27 December 2018, Italian industrial holding company PLT energia SpA wholly acquired the share capital of the subsidiary owners of a portfolio of wind farms in operation in the Puglia and Abruzzo regions from Podini Holdings SpA. The transaction had a total value of €80 million;

d on 27 December 2018, clean energy investor Glennmont Partners entered into a deal to sell its Italian solar power plants to investment fund Tages Capital; and

e on 17 December 2018, Canadian Solar Inc, one of the world's largest solar power companies, and TrailStone GmbH, a global commodities trader and investor in strategic commodity assets, entered into a 10-year PPA for the electricity produced by a 17.6MWp solar photovoltaic plant in Sicily. This PPA will cover 100 per cent of the electricity generated and is believed to be the longest-term PPA for a fully unsubsidised solar photovoltaic portfolio signed in Italy to date.

Although the latest estimates indicate that the mix of electricity production in most regions favours thermoelectric sources, certain regions were notable for their emphasis on hydroelectric power. These regions include Valle d'Aosta, Trentino-Alto Adige and Umbria. Furthermore, in regions such as Piedmont, Lombardy, Abruzzi and Calabria, hydroelectric generation remains an important, while not the principal, method of generation. For the south and, in particular, Basilicata, wind and photovoltaic electricity generation prevail.[18]

In 2018, RES electricity generation accounted for 40.3 per cent of the nation's electricity production and met 35.1 per cent of the electricity demand, which amounted to approximately 322TWh. RES production increased by 9 per cent from 2017. This growth can primarily be attributed to the growth of the hydroelectric sector, which recorded a 31 per cent increase in 2018 after a severe shortage of precipitation in 2017. Other RES sectors performed negatively in comparison with 2017: the photovoltaic sector was down by 4.7 per cent, geothermal by 1.9 per cent, wind by 1.4 per cent and bioenergy by 0.8 per cent.[19] Although complete data for 2019 is not yet available, as at March 2019, RES electric energy production had, thus far, increased by 5.2 per cent from the previous year.[20]

With regard to the photovoltaic sector, the total national capacity in 2018 amounted to 20,070MW, with newly installed capacity totalling 437MW. This marks a 7 per cent increase from 2017, in line with the positive trend that started in 2016 following the slowdown in 2015. This trend suggests that the photovoltaic market is ready to function independently of incentives. However, investors have signalled that they are waiting to see the final version of the RES1 Decree, currently being reviewed by the European Commission, which will govern RES support schemes for the next three years.[21]

The market value of the photovoltaic capacity installed in 2018 amounted to approximately €671 million. The residential market accounted for 50 per cent of the installed capacity – almost 60 per cent of the total photovoltaic capacity.[22] The data for 2018 confirms

18 SRM, MED & Italian Energy Report, March 2019, p. 77; see also Terna, Dati statistici, Elettricità nelle regioni italiane, 2018.

19 Energy & Strategy Group, Renewable Energy Report, May 2019, p. 55.

20 Terna, Rapporto mensile sul sistema elettrico, March 2019, p. 6.

21 Energy & Strategy Group, Renewable Energy Report, May 2019, p. 56.

22 ibid., p. 58.

the 2016–2017 trend towards large-scale plants. The increase in installations in the industrial sector signals the important role of 'prosumers' (who both produce and consume energy) particularly among Italian companies, who firmly prioritise lowering their electricity bills.[23]

In the wind sector, there was a decrease in the number of small wind turbine installations in 2018 because of the cessation of direct incentives for plants of power equal to or below 60kW as of 31 December 2017. This proved an impediment to investments in small wind farms, which are not yet economically viable without incentives.[24] The majority of wind power plants have a power capacity of over 5MW, with the average capacity being 18MW. The market value of newly installed turbines in 2018 was just under €630 million, with 92 per cent of plants having power capacity above 5MW.[25]

With respect to hydroelectric generation, the total national capacity of hydroelectric plants amounted to 18,842MW by the end of 2018, with newly installed capacity accounting for 140MW, marking a 45 per cent increase from 2017. The regions that recorded the greatest levels of increased capacity in 2018 were Piedmont (91.5MW) and Lombardy (38.25MW), together representing 93 per cent of the newly installed capacity.[26] The market value of the hydroelectric capacity installed in 2018 amounted to approximately €378 million and was attributable mainly to large-scale plants.[27]

The accumulated capacity for electricity generation from biomass (including solid urban waste, agroforestry residues, vegetable oils and biogas) exceeded 4.3GW at the end of 2018, with an overall growth of 74MW; slightly higher than in 2017 (50MW).[28] It should be noted that under the new Biomethane Decree, biomethane producers are entitled to Consumer Release Certificates (CICs), which accredit the feeding of biomethane into the gas network. The CICs can be purchased by the producers of gasoline and diesel to comply with their minimum biofuel supply obligations. CICs are issued on a monthly basis and can either be delivered to the GSE or sold on the exchange market managed by the Electricity Market Operator. In addition to the minimum biofuel supply obligation, the Biomethane Decree provides for the offtake of advanced biomethane and other advanced biofuels by the GSE for 10 years at a reference price equal to €375/CIC. A higher number of CICs is granted to biomethane and advanced biofuels produced from byproducts such as algae, green waste, household waste, agricultural waste and food-industry waste.

23 ibid., p. 57.
24 ibid., p. 60.
25 ibid., p. 61.
26 ibid., p. 62.
27 ibid., p. 64.
28 ibid., p. 66.

III THE POLICY AND REGULATORY FRAMEWORK

i The policy background

In implementing Directive 2009/28/EC, the Italian legislature set a 17 per cent target for the share of RES in the energy mix by 2020.[29] Italy achieved this national objective for the first time in 2014, well in advance of the 2020 target date.

In November 2017, the MSE published the National Energy Strategy, a 10-year road map setting out the objectives for 2030 and encouraging further RES development.[30]

The National Energy Strategy set the ambitious target share percentage for RES of 28 per cent of gross final energy consumption by 2030, comprising:

a a 55 per cent target for electricity (previously 33.5 per cent in 2015);
b a 30 per cent target for thermal energy (previously 19.2 per cent in 2015); and
c a 21 per cent target for transport (previously 6.4 per cent in 2015).

Pursuant to EU Regulation 2016/0375 on the Governance of the Energy Union, the Italian government adopted a draft of its 10-year strategy on energy efficiency and environmental sustainability on 31 December 2018 and submitted it to the EU Commission on 9 January 2019 for the Commission's observations.[31] The strategy, or Integrated National Energy and Climate Plan (PNIEC), tackles five categories concurrently: decarbonisation; energy efficiency; energy security; the internal energy market; and research, innovation and competitiveness. The draft PNIEC sets a higher target for the RES share of the energy mix, raising the country's 2030 target to 30 per cent, compared to the 28 per cent target previously set by the National Energy Strategy.[32] The draft PNIEC also aims to meet the objectives set by EU Directive 2018/2001 on the promotion of the use of energy from renewable sources, which establishes a new binding RES target for 2030 for the EU of at least 32 per cent and includes a clause that leaves open the possibility of increasing the target by 2023.

The draft PNIEC sets ambitious goals for installed RES power capacity by 2030, in particular for wind power (an increase of 88 per cent) and photovoltaic power (an increase of 158 per cent). Other RES power sources have more modest expectations: an increase of 2 per cent for hydroelectric power, an increase of 17 per cent for geothermal power and a decrease of 9 per cent from biomass (the only reduction). This increased installed capacity would result in an overall increase of installed RES capacity by 75 per cent.[33] Electricity generation is expected to increase by 65 per cent from the present rate, reaching over

29 Legislative Decree No. 28/2011, Article 3 provided that the national target for final consumption of energy in the transport sector produced by RES was to be at least 10 per cent. In addition, the Ministerial Decree of 15 March 2012 (known as the Burden Sharing Decree) set out the objectives for each Italian region for 2020, with a view to proportionally sharing the activities necessary to achieve this national target. It also made the state-owned company GSE responsible for monitoring and calculating the consumption of RES-generated energy.

30 See http://www.sviluppoeconomico.gov.it/index.php/en/202-news-english/2037432-national-energy-strategy.

31 Pursuant to Article 9 of the Regulation on the Governance of the Energy Union, the Commission may issue specific recommendations on the Draft Integrated National Energy and Climate Plan submitted by Italy no later than 30 June 2019.

32 See Draft Integrated National Energy and Climate Plan, available at https://ec.europa.eu/energy/sites/ener/files/documents/ec_courtesy_translation_it_necp.pdf.

33 Energy & Strategy Group, Renewable Energy Report, May 2019, p. 74.

55 per cent of national consumption (estimated to be approximately 337TWh by 2030).[34] Thermal energy generated from RES is essential to achieve these national targets, as the gross final consumption for heating and cooling is around 56Mtoe,[35] or just under 50 per cent of the total energy consumption.[36] In 2017, the consumption of thermal energy generated from RES amounted to 11Mtoe.[37] The Italian government is also proactively supporting RES research and innovation, and Italy is among the promoters of Mission Innovation[38] (a global initiative resulting from the COP21 Paris Agreement to launch innovative clean-technology projects) and is committed to doubling the value of public resources allocated to investments in clean-energy research and development, from €222 million in 2013 to €444 million in 2021.

A generous incentive system has encouraged a significant increase in RES in Italy; the incentives comprise a variety of mechanisms, including the following:

a the Cip 6/92 mechanism, which is a feed-in tariff.[39] This mechanism is only available to plants that fell within the scope of the Cip 6/92 resolution while it was still in force, and the tariff is applicable for a certain period, typically up to 20 years (accordingly, the number of plants entitled to benefit from the incentive is gradually decreasing);

b the Energy Account system (a feed-in premium)[40] for electricity produced by photovoltaic plants that had commenced activities by 26 August 2012;[41] as at 31 December 2017, there were over 550,000 agreements under this incentive system, corresponding to over 22,000GWh of incentivised energy. The incentives paid amounted to over €6.4 billion;[42]

c green certificates, which were awarded by the GSE in proportion to the amount of energy produced by RES and cogeneration plants that had commenced activities by 31 December 2012. The number of green certificates awarded depended on the type

34 ibid., p. 75.

35 Million tonnes of oil equivalent.

36 Energy & Strategy Group, Renewable Energy Report, May 2019, p. 81.

37 GSE, Annual Report, 2018, pp. 185–186. Consequently, to achieve these goals, it is necessary to reduce consumption by 20 per cent by 2030. Thermal energy generated from RES, therefore, has strong links with the draft Integrated National Energy and Climate Plan measures to increase energy efficiency, such as tax deductions on expenses related to the energy-efficient modernisation of buildings and building renovation; tradable certificates ('white certificates') released by the GSE following energy-efficiency interventions in energy end use; and obligations to have buildings include the use of RES to provide a minimum percentage of the building's energy needs.

38 See http://mission-innovation.net/about-mi/overview/.

39 A feed-in tariff includes an 'incentive' component and a component for remuneration for electricity conveyed into the network.

40 A feed-in premium is an incentive granted exclusively for the electricity produced, and does not include remuneration for the sale of that energy, which might even be self-consumed by the producer or sold to the market, generating extra profits.

41 The Energy Account system includes a standard premium related to the amount of energy produced.

42 Italian Court of Auditors, Decision No. 10/2019, Annual Report on GSE Financial Management, February 2019, p. 36.

of plant used for the energy generation.[43] As of 1 January 2016, the green certificate system has been replaced by a new incentive system in the form of extra remuneration granted by the GSE to operators formerly entitled to green certificates;[44]

d feed-in tariffs for electricity delivered to the grid by RES plants (except for photovoltaic plants) not exceeding 1MW power (200kW for wind plants) that had commenced activities by 31 December 2012;[45]

e tariff incentives for electricity delivered to the grid by photovoltaic plants that had commenced activities between 27 August 2012 and 6 July 2013 (in the form of a feed-in tariff for plants not exceeding 1MW in power and in the form of a feed-in premium for the other plants); and

f tariff incentives for net electricity delivered to the grid by RES plants (except photovoltaic plants) and thermodynamic solar plants that had commenced activities from 1 January 2013 (in the form of a feed-in tariff for plants not exceeding 500kW in power and a feed-in premium for plants exceeding the 500kW threshold).[46] The threshold for access to the feed-in premium was then increased to 1MW by the Ministerial Decree of 6 July 2016.

The governmental incentives for RES-generated electricity amounted to approximately €12.5 billion in 2017, which was paid by the A3 tariff on electricity bills.[47] In 2018, governmental incentives for RES-generated electricity is estimated to be approximately €12 billion. This reduction is primarily due to the progressive expiration of the incentive entitlement period for some RES plants.[48] Electricity produced by RES plants benefiting from these incentives amounted to around 65TWh in 2017, and this is expected to have remained the same in 2018.[49]

In addition to purely economic incentives, such as those mentioned above, the Italian legal framework provides for other important measures that favour RES projects, such as simplified and expedited administrative procedures for the construction and operation of new RES plants[50] and, more importantly, priority access to the electricity transmission grid

43 Green certificates were issued by the GSE and represented the environmental value of electricity generated by an RES plant (i.e., an amount of CO_2 emissions lower than that produced by a plant fired by traditional fuels, such as oil). Green certificates could be traded separately from the electricity produced over the counter or through a trading platform managed by the state-owned GES, thus representing a further remuneration for RES electricity producers. Indeed, according to the legislation, each electricity producer (or importer) had an obligation to generate (or put into the grid) a given share of electricity generated from RES or, alternatively, to obtain a corresponding amount of green certificates.

44 Ministerial Decree of 6 July 2012, Article 19. The value of the incentives replacing green certificates has been set out for 2018 in ARERA Resolution No. 32/2018/R/EFR of 25 January 2018.

45 Law No. 244/2007 and Ministerial Decree of 18 December 2012.

46 Ministerial Decree of 23 June 2016.

47 ARERA, Report No. 428/2018/I/efr of 2 August 2018, p. 68.

48 ibid., p. 6.

49 ibid., p. 67, figures 40 and 41.

50 Legislative Decree No. 28/2011, Article 4.

for RES-generated electricity (e.g., priority dispatch).[51] These measures are neutral with respect to the type of RES feeding the plant. Furthermore, the 2019 Budget Law extended through 2019 a tax deduction of 65 per cent on expenses related to the energy-efficient modernisation of buildings (an 'ecobonus'), including for the installation of photovoltaic panels to heat water. It also confirmed a 50 per cent tax deduction on building renovation.[52]

Additionally, under Italian law, construction projects for new buildings and restructuring of existing buildings must include the use of RES to cover at least 50 per cent of the building's energy needs (both electricity and heat). Failure to comply with this provision will result in refusal of the building authorisation.[53]

Finally, income from the production and sale of agroforestry RES and photovoltaic energy[54] qualifies as agricultural income for tax purposes, within a determined threshold, to the extent that the energy is obtained from the land owned by the farmer. According to Italian tax law, agricultural income is not analytically computed; rather, it is determined using cadastral ratios as a form of tax incentive.[55] Energy incentives are normally taxed as business income for companies involved in the activity of the production and sale of energy.

ii The regulatory framework

The renewable energy sector is regulated by primary legislation (both national and regional)[56] and secondary legislation. The secondary legislation is adopted by the MSE and the Ministry for the Environment, Land and Sea (MATTM) or the ARERA. In particular, these bodies have the following repsonsibilities.

The MSE is responsible for formulating and implementing Italy's energy policy, by defining the strategy and setting out general principles for the organisation and functioning of the renewable energy market.[57]

The MATTM is responsible for climate policy. It also co-signs the MSE policy measures promoting renewable energy and energy efficiency.

The ARERA is an independent regulatory body governed by a committee of five members elected by Parliament for seven years. It regulates, controls and monitors the electricity and gas markets in Italy. It was established under Law No. 481/1995 for the purpose of protecting consumer interests, promoting competition and ensuring quality, efficiency and cost-effectiveness of energy services. The ARERA determines its costs, which are entirely

51 Legislative Decree No. 79/1999, Article 3, Paragraph 3 and Article 11, Paragraph 4, transposing Directive 2009/28/EC. This means that, in an oversupply scenario, RES plants will still be dispatched in the context of the power exchange market irrespective of price. In their White Paper on Renewables in the Wholesale Market, ACER and CEER called for EU legislators to bring RES into the market, by removing the priority for RES in dispatching regimes.

52 The 2019 Budget Law, Article 1, Paragraph 67(a).

53 Legislative Decree No. 28/2011, Article 11.

54 Italian Revenue Agency, decision No. 86/E of 15 October 2015.

55 Italian Revenue Agency, decision No. 54/E of 18 July 2016; Law No. 266/2005, Article 1, Paragraph 423.

56 Article 117 of the Italian Constitution defines whether the national or the regional legislator is entitled to adopt relevant rules in the energy sector. For more details, see D Diaco, '"Produzione, trasporto e distribuzione nazionale dell'energia" nei giudizi di legittimità costituzionale in via principale' (2004–2015), Corte Costituzionale, Servizio Studi, available at http://www.cortecostituzionale.it/documenti/convegni_seminari/stu_281.pdf.

57 Legislative Decree No. 93/2011.

recovered by means of compulsory annual contributions paid by energy service providers.[58] Its regulatory powers include setting tariffs, defining service quality standards and regulating the technical and economic conditions governing access and interconnections to the networks. The ARERA issues general regulations applicable to energy market operators, and resolutions or orders applicable to single operators, for which it must provide comprehensive reasons. The ARERA may also issue fines.[59]

Every year, the ARERA submits to the relevant parliamentary committees a report on the use and development of RES plants[60] and a report on the development of small-scale generation.[61]

The state-owned GSE was established by Legislative Decree No. 79 of 16 March 1999 for the promotion and support of RES in Italy. In particular, the GSE works to foster sustainable development by providing support for electricity generated from renewables. It is in charge of (1) determining which plants meet the conditions set by law to benefit from incentive mechanisms; (2) disbursing economic incentives; (3) checking that the conditions for the recognition or maintenance of incentives are met by carrying out inspections and assessments of the plants that have an agreement with the GSE; (4) forecasting and monitoring electricity delivered into the grid by RES plants to minimise imbalances in the electricity system; (5) promoting information campaigns to spread the culture of environmental sustainability; and (6) monitoring the development of RES projects.

There are simplified and expedited procedures for the regulatory approvals required to construct and operate RES plants,[62] including, in particular, the procedures outlined below.

The construction and technological enhancement of new RES electricity plants is subject to a single authorisation issued by the region concerned or the delegated province (or by the MSE for plants of power equal to or greater than 300MW), following a unified proceeding among all the public entities with authorities involved in the project.[63] This single authorisation procedure applies even where the project concerns more than one region or delegated province[64] or where regions have a special statute under the Italian Constitution.[65] The competent public entity must issue a decision on the request for the licence within 90 days.[66] If the project has nominal power greater than 1MW, it is subject to an environmental impact assessment or to the pre-screening procedure, in which case, the single authorisation cannot be issued until this procedure has been completed.

The construction of small plants with low generation capacity (e.g., photovoltaic plants on building roofs)[67] is subject to a further simplified authorisation procedure. The owner of the building is only subject to the obligation to notify the competent municipality with

58 Law No. 481/1995, Article 2.

59 ibid., Paragraph 20(c).

60 Law No. 239/2004, Article 1, Paragraph 12.

61 ibid., Paragraph 89.

62 Legislative Decree No. 28/2011, Article 4.

63 Legislative Decree No. 387/2003, Article 12.

64 Ministerial Decree of 10 September 2010, National Guidelines for the Authorisation of RES Plants, Paragraph 10.5.

65 Italian Constitutional Court, Judgment No. 275 of 6 December 2012.

66 Legislative Decree No. 387/2003, Article 12, Paragraph 4.

67 See Ministerial Decree of 10 September 2010, National Guidelines for the Authorisation of RES Plants, Paragraphs 12–13, for an exhaustive list of activities subject to this authorisation regime.

a declaration and a detailed technical description of the project at least 30 days before starting construction activities. The application is authorised via tacit acceptance: work can commence 30 days after submission if no replies or notices have been issued by the municipality.[68]

There is further procedural simplification for the construction of certain small-scale installations that generate electricity or thermal energy from renewable sources, which are considered to be minor works and as such are exempt from building-permit requirements. The works commencement notification must be sent to the municipality together with a detailed report signed by a certified engineer. There is no requirement to wait 30 days before starting work and construction activities can start immediately after the communication has been made.[69]

The table below shows when the building of small RES plants is subject to the simplified authorisation procedure or to the simple communication regime.[70]

RES	Plant type	Generation capacity (kW)	Applicable administrative procedure
Photovoltaics	Plant attached to or integrated into the roof of an existing building and whose surface does not exceed that of the roof on which it is built	–	Simple communication
	Plant on an existing building or on an existing building's premises	0–200	
	Photovoltaic module placed on a building and whose total surface does not exceed that of the roof on which it is located	–	Simplified authorisation procedure
	Other photovoltaic plants	0–20	
Biomass, landfill gas, waste gas from purification processes and biogas	Cogeneration plant (microgeneration)	0–50	Simple communication
	Plant in an existing building	0–200	
	Cogeneration plant (small cogeneration)	50–1,000	Simplified authorisation procedure
	Plant powered by biomass	0–200	
	Plant powered by landfill gas, gases left over from purification processes and biogas	0–250	
Wind	Individual wind generator plant with a height not exceeding 1.5 metres and a diameter not exceeding 1 metre installed on the roof of an existing building	–	Simple communication
	Other wind power plants	0–60	Simplified authorisation procedure
Hydroelectric and geothermal	Hydroelectric and geothermal plant built in an existing building	0–200	Simple communication
	Other hydroelectric and geothermal plants	0–100	Simplified authorisation procedure

Variations to projects relating to the construction of RES plants can lead to a range of authorisation procedure issues, both before and after the conclusion of works. As a general principle, minor amendments to the existing plants may be authorised by simplified permits (sworn declarations delivered to the municipality), while major modifications that affect the volume, power or occupied area require a new single authorisation, which is issued following a unified proceeding.

68 Legislative Decree No. 28/2011, Article 6.

69 See www.gse.it/normativa/autorizzazioni.

70 Source: KPMG, Advisory: Investing in renewables, 2011, study on Italian legislation by KPMG (authors' translation).

The Italian regulatory framework also provides RES plants with favourable conditions for access to the distribution grid. In particular, the following special schemes are available for conveying RES-generated electricity into the electricity grid.

Simplified purchase–resale can be requested by non-programmable RES plants, irrespective of their capacity generation, except for plants benefiting from feed-in-tariff incentives (which already include the value of electricity) and plants benefiting from incentives provided under the Ministerial Decrees of 6 July 2012 and 23 June 2016. Under this scheme, the GSE plays the role of trade intermediary between the producer and the electricity system. The GSE purchases electricity from producers at a standard rate defined by the ARERA based on market prices (e.g., the regional price on the day-ahead market on the Italian Power Exchange)[71] and then resells the electricity to the market. The simplified purchase–resale scheme does not provide any economic incentive[72] but a simplification for producers benefiting from this sale scheme, as they avoid the accreditation procedures required for trading on the Italian Power Exchange.

The net metering scheme can be requested by RES plants with a generation capacity not exceeding 200kW and that commenced activities from 2015. This upper limit was raised to 500kW by Decree Law No. 91/2014. The net metering scheme is a regulatory measure enabling RES plants to exchange economically the value of electricity that they deliver into the grid in a given hour with the value of electricity that they take from the grid in a different hour.[73] This scheme actually results in an economic incentive, as RES plants do not pay transport tariffs for the network use with respect to electricity that they convey into the grid under the net metering scheme.

Furthermore, and more importantly, the legal framework grants RES-generated electricity priority access to the transmission and distribution grid, thus giving it a competitive advantage over electricity generated from conventional sources.[74]

Additionally, non-programmable RES plants can also benefit from a more favourable regime for the application of imbalance payments, which are the penalties plants must pay if they fail to comply with their daily generation plan.[75] Unlike the previous regime, which fully exempted non-programmable RES from the application of imbalance payments, the current regime, which applies imbalance payments to RES plants, aims to foster better generation forecasting from non-programmable RES, thereby reducing the costs passed on to consumers.

71 Legislative Decree No. 387/2003, Law No. 239/2004 and ARERA Resolution No. 280/07.

72 Minimum guaranteed prices are, however, available for small electricity producers and only for small volumes of electricity generated.

73 Legislative Decree No. 387/2003, Legislative Decree No. 20/2007 and ARERA Resolution No. ARG/elt/74/08.

74 Legislative Decree No. 79/1999, Article 3, Paragraph 3 and Article 11, Paragraph 4, transposing Directive 2009/28/EC.

75 See ARERA Resolution No. 522/2014/R/eel.

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

i Project finance transaction structures

Historically, project finance has been the preferred tool for financing renewable energy projects in Italy. In a project finance scheme, the specific project is evaluated exclusively regarding its profitability (i.e., on cash flows the project will generate). The cash flows also serve as the primary guarantee for the debt reimbursement to the financing entity.[76]

A project finance transaction usually includes a number of participants, each having a specific role. The sponsors are the project promoters, who design the project and evaluate the costs, the bankability and the profitability of the project. The core business of sponsors of renewable energy projects is often manufacturing goods used in renewable energy projects (e.g., turbines and solar panels) or providing services associated with these projects.

To achieve complete legal and economic separation of the project sponsors from the project, the project finance scheme usually requires setting up a specific legal entity (a special purpose vehicle (SPV)), which is in charge of implementing the specific project assigned to it. The SPV is usually a limited company, and its by-laws limit its purpose and activities solely to the implementation of the project. The SPV does not have any financial means other than those provided to it for the implementation of the project. Its assets are isolated, by means of guarantees and contractual constraints, for the benefit of the institutions financing the project (ring-fencing).[77]

The structure described above limits the risk for the capital invested by the promoters and indemnifies them from the risk of losses by the SPV. The success of project financing for renewable energy is mainly due to the unlikelihood of losses by the SPVs operating RES plants, because of the economic incentives and the dispatching priority for RES plants. The risk ring-fencing and remoteness of insolvency linked to this kind of financing allows the banks operating in this sector to offer low margins and interesting debt-to-equity ratios.

The sponsors, or, if it is set up immediately, the SPV, submit the project to the competent public entities and authorities (the MSE, the regions concerned, or municipalities) to obtain the necessary approvals according to the applicable administrative procedure.

The contractual structure for project financing of renewable energy projects is complex. It includes a network of agreements involving the sponsors, the SPV (which manages the operation and maintenance contracts), financing institutions (which manage financial contracts), public entities, companies in charge of the engineering, procurement and physical construction of the plant (EPC contractors) and companies in charge of the operation and maintenance of the plant (O&M contractors). As mentioned, the EPC contractors are often the sponsors.[78]

The principal document in renewable energy project financing is the project finance loan agreement, which governs the relationship between the financing institution and the SPV. The terms of the project finance loan agreement do not take into account the financial stability of the sponsors or the SPV – only the capability of the financed project to generate cash flows. Other fundamental documents in the project financing scheme are the EPC contracts (entered into by the SPV and the EPC contractors), the O&M contracts

76 S M Sambri, Modalità di realizzazione di impianti di produzione di energia con risorse private (project financing), in E Picozza and S M Sambri (eds.), *Il diritto dell'energia*, CEDAM, 2015, p. 669.

77 ibid., p. 669.

78 ibid., p. 679.

(entered into by the SPV and the O&M contractors), the direct agreements (under which the financing institution is entitled to intervene in the relationships between the SPV, the EPC contractors and the O&M contractors) and the financial collateral arrangements (the 'security package', including the loan guarantees).

A notable opportunity provided by the Italian regulatory framework to promote the bankability of renewable energy projects is that plants admitted to a tariff incentive scheme may assign to third parties (namely credit institutions) the receivables from the GSE.[79] This is a further specific guarantee in addition to the other standard guarantees that are part of the security package.[80]

ii Distributed and residential renewable energy

Distributed generation by RES in Italy has developed significantly in the past 10 years, both in terms of number of plants and capacity installed.

Puglia is the Italian region with the highest value of electricity generated by RES small-scale generation, mainly because of the strong presence of photovoltaic and wind power plants,[81] while generation from hydroelectric plants is highest in the north of Italy, because of the greater presence of waterways.[82]

Small-scale generation offers different ownership structures in Italy. Households and small businesses can purchase their own RES plants directly, generally as part of a service including design, installation, connection to the distribution grid and testing and maintenance of the plant (a turnkey service).

Alternatively, RES small generation projects can be carried out by ESCOs,[83] usually under an EPC scheme. Under an EPC scheme, the ESCO conducts an in-depth analysis of customer cost savings from a given distributed RES generation project. The ESCO then implements the project, often with the financial support of third parties, and becomes the owner and manager of the plant, while the customer pays the ESCO periodical fees that are calculated by reference to the amount of energy generated by the plant and to the level of cost savings achieved by the customer. With the EPC, the ESCO guarantees its customer a certain level of energy generated by the plant and a certain level of cost savings by means of the ESCO RES plant project. The European Code of Conduct for EPC schemes defines the basic values and principles that are considered fundamental for the successful preparation and implementation of EPC projects. In Italy, the role of National Code Administrator is held by Federesco, the National Federation of Italian ESCOs. ESCO projects in Italy tend to involve the commissioning and installation of the plant equipment.[84]

79 See https://www.gse.it/servizi-per-te/supporto/cessione-crediti.

80 S M Sambri, Modalità di realizzazione di impianti di produzione di energia con risorse private (project financing), in E Picozza and S M Sambri (eds.), *Il diritto dell'energia*, CEDAM, 2015, pp. 705–706.

81 ibid., p. 42.

82 ibid., p. 45.

83 Legislative Decree No. 115/2008, Article 2(i), defines an ESCO as 'a natural or legal person that delivers energy services and/or other energy efficiency improvement measures in a user's facility or premises, and accepts some degree of financial risk in so doing. The payment for the services delivered is based (either wholly or in part) on the achievement of energy efficiency improvements and on the meeting of the other agreed performance criteria.'

84 See F Arecco, G Dall'O, *Energia sostenibile e fonti rinnovabili*, IPSOA, 2012, p. 397.

iii Non-project finance development

While project finance is the most common scheme for financing renewable energy projects in Italy, financial leases, whereby a leasing company acquires the ownership of an asset and leases it to the SPV, have been very common, particularly for the financing of small-scale projects (mainly photovoltaic plants) because of the limited arrangement costs. The reduction in the interest rates for project financing coupled with the higher termination costs typical of leasing structures have rendered this financing tool less competitive.[85]

Additionally, some major companies finance renewable energy projects using traditional schemes, such as both equity and debt financing.

Regarding debt financing options, green bonds have increased in popularity in Italy in the past few years.[86]

Green bonds have the same features as ordinary bonds, but the issuer undertakes a specific obligation to use the capital collected to finance projects with specific environmental benefits and impacts. Returns on these bonds for investors do not differ from returns on ordinary bonds, but issuers and traders are driven by the common intention to promote renewable energy.

The Italian market for green bonds started in 2014, when the Italian energy operator Hera SpA issued for the first time a €500 million green bond. The capital was employed in the financing of 26 renewable energy projects. In the following years, many other Italian energy operators issued green bonds, with a commitment to employ the capital in renewable energy and energy-efficiency projects.

Today, Italian financial institutions' interest in financing renewable energy is rapidly increasing and numerous green bonds have already been issued.

The Italian company Assicurazioni Generali SpA, which is the third-largest insurance company in the world, announced in January 2018 an underwriting commitment to increase the percentage of its portfolio related to the renewable energy sector by investing €3.5 billion in green bonds by 2020 and gradually divesting from coal-related companies.[87]

In April 2019, transmission system operator Terna launched a green bond for €500 million. The green bond was placed by a syndicate of banks including Banca IMI, BNPP, Citi, Goldman Sachs, Mediobanca, Santander and UniCredit.[88]

In April 2019, UBI Banca issued a €500 five-year green bond. The bank's reference portfolio comprises loans primarily for solar (63 per cent), but also wind (23 per cent), biomass (8 per cent) and hydro (6 per cent) power generation.[89] Similarly, Cassa depositi e Prestiti[90] and Intesa San Paolo[91] issued benchmark-sized green bonds in 2017 and 2018, in connection with environmental sustainability projects.

85 DLA Piper, Doing Business in Italy, Energy Investor Guide 2018, p. 59.

86 Energy & Strategy Group, Renewable Energy Report, 2017, pp. 11–13.

87 https://www.generali.com/media/press-releases/all/2018/Generali-approves-climate-change-strategy-It-will-divest-2-billion-from-coal.

88 https://renewablesnow.com/news/italian-tso-terna-issues-eur-500m-green-bond-649355/.

89 https://www.ubibanca.it/contenuti/file/UBI%20Banca_3%20april%202019%20def.pdf.

90 https://www.cdp.it/sitointernet/en/social_bond_17.page.

91 https://www.group.intesasanpaolo.com/scriptIsir0/si09/sostenibilita/eng_prodotti_verdi.jsp#/sostenibilita/eng_prodotti_verdi.jsp.

In March 2019, energy producer ERG SpA issued its inaugural fixed-rate green bond for €500 million as part of its €1 billion Euro Medium Term Note Programme to facilitate its transition to renewable energy. The proceeds of the initial six-year bond will be used to finance or refinance renewable energy projects in Europe.[92]

In January 2019, Italian utility company Enel SpA placed a €1 billion green bond reserved for institutional investors, its third on the European market. The company will use the net proceeds to develop, construct and repower renewable energy plants, build and operate transmission and distribution networks, and execute sustainable mobility, smart lighting, energy efficiency and demand-response projects.[93]

V RENEWABLE ENERGY MANUFACTURING

Renewable energy manufacturing in Italy mainly concerns photovoltaic panels, wind turbine blades and wind turbines with a power rating below 80kW.[94]

The leading European factory manufacturing photovoltaic panels is located in Catania (Sicily) and is owned by the Italian energy operator 3SUN Srl, a company in the Enel Group. In March 2018, 3SUN Srl launched a project to convert the factory, intending to make it the first worldwide and exclusive manufacturer of HJT bifacial photovoltaic panels, which are based on heterojunction technology. This technology brings together two different kinds of silicon, amorphous and crystalline, generating particularly high yields.[95] The 3SUN Srl factory conversion project entails an investment of over €80 million, partly financed by the European Commission,[96] the MSE through the 'Ampere' project[97] and the Sicily region.

There are also some other smaller factories in Italy manufacturing solar panels, as well as an important factory manufacturing wind turbine blades, located in Taranto (Puglia) and owned by the Danish wind energy operator Vestas. The manufacturing of turbines for small hydroelectric plants is also growing notably.[98]

VI CONCLUSIONS AND OUTLOOK

Italy has experienced an impressive increase in renewable energy projects in the past decade, outpacing the target set by the EU and the Italian legislature for 2020. Building on the 2017 Italian National Energy Strategy, the PNIEC has set more ambitious goals by increasing the 2030 target figures for renewable energy and energy efficiency.

The latest legislative and policy developments form a robust basis for Italy to deliver on its energy policies for 2030 and beyond, as they address both cross-cutting elements to promote climate and energy action and specific provisions for sectoral action, where necessary. In fact, the measures adopted in recent years have already produced significant effects in the

92 https://www.erg.eu/documents/10181/386709/CS_26032019_ENG.

93 https://www.enel.com/media/press/d/2019/01/enel-launches-a-one-billion-euro-new-green-bond-in-europe.

94 Energy & Strategy Group, Report on renewable energies other than photovoltaic, 2013. See also Confindustria, Libro bianco per uno sviluppo efficiente delle fonti rinnovabili al 2030, December 2018.

95 See https://www.enel.com/content/dam/enel-common/press/en/2018-march/EGP%203SUN%20ENG.pdf.

96 In particular, the EU funds were awarded under the European Research and Development project Horizon 2020 European Call LCE-09-2016-2017.

97 See https://ec.europa.eu/inea/en/horizon-2020/projects/h2020-energy/photovoltaics/ampere.

98 Legambiente, Report on Renewable Municipalities for 2017, p. 118.

energy sector, even before the advances anticipated under the RES1 Decree are considered; the RES1 Decree – the first step in a wider government strategy under the general framework of the PNIEC – will also impact the regulatory framework of RES incentives.

Overall, Italy's comprehensive legislative framework, underpinned by government policies committed to environmental sustainability and to the involvement of credit and finance institutions in the green economy, has made Italy one of the global leaders in RES development. However, efforts should be stepped up to ensure that the 2030 targets are attained.[99]

While these objectives are particularly ambitious, meeting them is necessary to reach the critical targets established internationally.[100] In this context, a number of measures should be implemented, namely encouraging the installation of small-scale plants through the imposition of minimum quotas of RES consumption; promoting long-term contracts for large-scale power generation; enhancing self-consumption for small-scale power generation through net metering arrangements; upgrading existing plants by promoting repowering and revamping; simplifying procedures, in particular for environmental assessments; and promoting burden-sharing of the national RES target among the regions. Ultimately, achieving these goals calls for efficient government policies, encouraging investor confidence and decreasing the costs for the development of RES projects over the long term.

99 European Commission, Fourth Report on the State of the Energy Union COM (2019) 175.

100 See generally, Aspen, Shell Italia and Elettricità Futura, Massimizzare il potenziale energetico nazionale tra crescita e sostenibilità, 2018.

Chapter 9

JAPAN

Norifumi Takeuchi and Wataru Higuchi[1]

I INTRODUCTION

Japan is a country with limited natural energy resources and, as such, its major power generation sources have been thermal power and nuclear power. These are provided by 10 major utility companies in areas across Japan. However, because of the Great East Japan Earthquake and the subsequent accident at the Fukushima Daiichi nuclear power plant in March 2011, the government had to change its energy policy and structure drastically. After the earthquake, all 54 nuclear plants, which generated about 30 per cent of the power at that time, suspended their operations and, as at 31 March 2019, only nine nuclear plants have restarted operations.

Under these circumstances, the feed-in tariff scheme (the FIT Scheme), under which the total volume of electricity generated by renewable energy resources should be purchased at a fixed price (the FIT Price) for a fixed term (the FIT Term), was introduced in 2012 to address the need to secure alternative energy sources to replace nuclear power. Renewable source energy generation – solar power generation in particular – has been rapidly expanded since then. Set out below are recent data on electricity generated (in million kWh) by renewable source energy generation facilities. As shown in the chart, solar power generation has been the most popular source from the outset of the FIT Scheme.

Source type	April 2013 to March 2014	April 2014 to March 2015	April 2015 to March 2016	April 2016 to March 2017	April 2017 to March 2018	April 2018 to March 2019
Solar power (<10kWh)	485,686	578,017.8	648,628.4	711,688.7	782,689.5	674,397.8
Solar power (≥10kWh)	425,466.9	1,317,731	2,459,108	3,454,952.2	4,261,477.4	3,892,502.2
Wind power	489,638.3	492,082.3	523,259.9	586,179.9	616,663.7	476,081.2
Hydroelectric power	93,552.6	107,277.2	147,632.9	200,787.3	245,829.7	224,511.5
Geothermal power	570.9	608.1	5,881.1	7,620.2	10,126.9	9,132.5
Biomass power	316,940	364,438	539,014.4	736,506.5	1,024,778.2	890,802.2
Total	1,811,854.7	2,860,154.4	4,323,524.7	5,697,734.8	6,941,565.4	6,167,427.4

Further, since the introduction of the FIT Scheme, the following three material changes have been observed.

First, the FIT Price of solar power has decreased continuously, mainly because of sudden drops in the costs of facilities, such as the price of solar modules.

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Second, there have been frequent reports of problematic businesses having been certified to sell electricity under the FIT Scheme without having secured the necessary land required for energy generation, ultimately resulting in delays to the commencement of their operation (and, in some cases, entities would secure the entitlement to sell electricity for the sole purpose of transferring or selling that entitlement to another party). In response, amendments have been made to better ensure the certainty of projects and the prompt commencement of their operation.

Third, a rapid increase in renewable energy generation has caused a lack of transmission line capacity in some areas. As a result, there are currently new solar and wind power projects operating in certain areas where there are no restrictions on the output from renewable energy generation facilities. Although utility companies have recently adopted policies on expanding transmission line capacity, the issue has yet to be fully resolved.

II THE YEAR IN REVIEW

The Act on Promotion of Utilisation of Sea Areas for the Development of Marine Renewable Energy Generation Facilities was passed by the Diet and came into force on 1 April 2019. This Act allows the long-term use (up to 30 years) of certain general sea areas for offshore wind power projects under permits issued by the governmental agency. It is expected that this Act will promote offshore wind power projects, which are not so popular in Japan at the moment.

III THE POLICY AND REGULATORY FRAMEWORK

i The policy background

The Japanese government revised its strategic energy plan (the Fifth Strategic Energy Plan) in July 2018.[2] The plan calls for nuclear energy to account for 20 to 22 per cent of power generation by 2030, with 22 to 24 per cent coming from renewable energy sources, while coal's share will be reduced to 26 per cent, liquefied natural gas's to 27 per cent and oil's to just 3 per cent. This clearly indicates that the government aims to convert renewable energy into a major power source.

ii The regulatory framework

Main source of law and regulation

In Japan, the main source of law and regulation is the Act on Special Measures concerning the Procurement of Renewable Energy Sources by Electric Utilities (the Renewable Energy Act).

Under the Renewable Energy Act, renewable energy subject to the FIT Scheme is currently limited to certain renewable energy sources: solar, wind, water (currently statutorily limited to small and medium hydroelectric generators with an output of less than 30,000kW), geothermal and biomass.

2 https://www.meti.go.jp/english/press/2018/0703_002.html.

Regulators

The energy industry in Japan, which encompasses electric power, gas and other energy resources, is regulated by the Ministry of Economy, Trade and Industry (METI) or, more specifically, the Ministry's Agency for Natural Resources and Energy. As such, the Renewable Energy Act is administered under the supervision of the METI. For example, under the FIT Scheme, the METI grants certification for generation businesses, and determines the FIT Price and the FIT Term on an annual basis.

Outline of FIT Scheme

In summary, the FIT Scheme ensures that the total volume of electricity generated by renewable energy generation facilities is purchased by utility companies (in most cases, one of 10 major utility companies) at the FIT Price for the FIT Term.

The steps to be undertaken by an entity (a Generator) to be able to generate and sell electricity under the FIT Scheme can be summarised as follows:

a the Generator executes an interconnection agreement with one of the utility companies for the Generator's renewable energy generation facility (the first step);

b the Generator obtains certification by the METI of the Generator's renewable energy generation facility for its generation business in accordance with the requirements of the Renewable Energy Act (the second step); and

c the Generator executes a power purchase agreement (PPA) with one of the utility companies for the Generator's duly certified renewable energy generation facility (the third step).

The FIT Price, the FIT Term and the FIT Scheme process outlined above, along with a relatively new regulation concerning commercial operation deadlines, are discussed in detail below.

FIT Price and FIT Term

The FIT Price and the FIT Term for each fiscal year (from 1 April to 31 March) are determined annually by the METI, based on the opinion of an independent advisory committee. The independent advisory committee is composed of five neutral third-party members appointed by the METI with the consent of both houses of the Diet.

As an exception to this (provided certain circumstances are met), the METI may determine the FIT Price by an auction system. This auction system is applicable to facilities producing (1) solar power of 500kW or more from the fiscal year starting from 1 April 2019 (this figure was 2,000 kW or more until the fiscal year starting from 1 April 2018); and (2) biomass power (generated by certain wood or agricultural products with a capacity of 10MW or more or by biomass liquid fuel). The maximum price and minimum price for the FIT auction conducted in October 2018 were ¥15.45/kWh and ¥14.25/kWh respectively.

Set out below are the changes in the FIT Prices as well as applicable FIT Terms from the outset of the FIT Scheme. In relation to solar power, as a reflection of, among other things, the sudden drop in the price of solar modules, the FIT Price is falling (see notes below). In contrast, measures have been taken to establish favourable pricing for, and support investment in, offshore wind power and existing headrace tunnel-type medium and small-scale hydroelectric power generators.

Source type	Electricity generated	Fit Price (excluding tax)							FIT Term
		2013	2014	2015	2016	2017	2018	2019	
Solar power	<10kWh	¥38	¥37	¥33–¥35 based on device used	¥31–¥33 based on device used	¥25–¥30 based on device used	¥25–¥28 based on device used	¥24–¥26 based on device used	10 years
	≥10kWh <500kWh	¥36	¥32	¥29 (1Aprilto 30 June) or ¥27 (after 1 July)	¥24	¥21	¥18	¥14	20 years
	≥500kWh <2,000kWh	¥36	¥32	¥29 (1 April to 30 June) or ¥27 (after 1 July)	¥24	¥21	¥18	Price set through a auction system	20 years
	≥2,000kWh	¥36	¥32	¥29 (1 April to 30 June) or ¥27 (after 1 July)	¥24	Price set through an auction system	Price set through an auction system	Price set through an auction system	20 years
Wind power	<20kWh	¥55	¥55	¥55	¥55	¥55	¥17 or ¥20 based on device used	¥17 or ¥20 based on device used	20 years
	≥20kWh	¥22	¥22	¥22	¥22	¥18 or ¥21 based on device used	¥17 or ¥20 based on device used	¥16 or ¥19 based on device used	20 years
	Offshore wind power*		¥36	¥36	¥36	¥36	¥36	¥36	20 years
Geothermal power	<15,000kWh	¥40	¥40	¥40	¥40	¥19–¥40 based on device used	¥19–¥40 based on device used	¥19–¥40 based on device used	15 years
	≥15,000kWh	¥26	¥26	¥26	¥26	¥12–¥26 based on device used	¥12–¥26 based on device used	¥12–¥26 based on device used	15 years
Hydroelectric power	<200kWh	¥34	¥34	¥34	¥34	¥34	¥34	¥34	20 years
	≥200kWh <1,000kWh	¥29	¥29	¥29	¥29	¥29	¥29	¥29	20 years
	≥1,000kWh <5,000kWh	¥24	¥24	¥24	¥24	¥27	¥27	¥27	20 years
	≥5,000kWh <30,000kWh	¥24	¥24	¥24	¥24	¥20	¥20	¥20	20 years
Existing headrace tunnel-type medium and small-scale hydroelectric power†	<200kWh		¥25	¥25	¥25	¥25	¥25	¥25	20 years
	≥200kWh <1000kWh		¥21	¥21	¥21	¥21	¥21	¥21	20 years
	≥1,000kWh <5,000kWh		¥14	¥14	¥14	¥15	¥15	¥15	20 years
	≥5,000kWh <30,000kWh		¥14	¥14	¥14	¥12	¥12	¥12	20 years

Source type	Electricity generated	Fit Price (excluding tax)							FIT Term
		2013	2014	2015	2016	2017	2018	2019	
Biomass power**		¥13–¥39 based on material used	¥13–¥39 based on material used	¥13–¥40 based on material used	¥13–¥40 based on material used	¥13–¥40 based on material used	¥13–¥40 based on material used	¥13–¥40 based on material used	20 years

* Offshore wind power: generators that require a vessel for access for construction and operational maintenance.
† Existing headrace tunnel-type medium and small-scale hydroelectric power: generators that utilise existing headrace tunnels with renewable electric power equipment and hydraulic steel pipes.
** Excluding biomass power generated by certain wood or agricultural products with a capacity of 10MW or more and biomass power generated by biomass liquid fuel, which are subject to an auction system.

Grid connection process (first step)

To sell electricity to a utility company under the FIT Scheme, power generation facilities must be connected to the utility companies' electricity grids. A grid connection agreement therefore must be entered into with the utility company. As the grid connection agreement is required to obtain certification by the METI, an application for a grid connection agreement should be completed prior to making an application to the METI. Each major utility company has, and posts on its website, standard terms for its grid connection agreement, which may be subject to negotiation in each project, although it is not practically possible to drastically change the standard terms.

Prior consultations with the relevant utility company are not mandatory but are customary and are conventionally expected. The consultations with the utility company take the form of a preliminary consultation and a follow-up detailed consultation.

Certification granting process (second step)

Certification by the METI is the core element of the FIT Scheme. To obtain the certification, a plan of the generation business shall be submitted to the METI along with certain supporting documents. The plan shall include detailed information on, among other things, the Generator, facilities, project site, maintenance system and estimated costs. It should be noted that specifications for the facilities such as manufacturer and model number of solar modules must also be described in the plan.

The METI will grant the certification when it judges the plan and power generation facilities to be appropriate in light of various criteria. Among the key points are the ability to secure a grid connection agreement, and the project site. Having a grid connection agreement and a project site would indicate that the renewable energy generation facility is at a much more certain stage of development, and more likely to obtain the certification. These criteria were introduced to address the past issue of certification being obtained without sufficient resources in place resulting in delays to the commencement of operations (as mentioned above in Section I).

According to the website of the Ministry's Agency for Natural Resources and Energy, it will take about three months for the METI to grant the certification (but four months for biomass power projects).

After the certification is granted, the METI's authorisation is required to amend the plan – except for minor amendments, for which a post-fact notification to the METI is required. For example, if a Generator would like to change the manufacturer or model number of the solar modules indicated in the plan, it should obtain the METI's authorisation.

In addition, even after the certification is granted, the METI may cancel the certification if it finds that the business is not conducted in accordance with the plan, the plan is no longer able to satisfy one of the criteria for the certification, or the Generator does not comply with the METI's orders.

Power purchase agreement (third step)

Under the Renewable Energy Act, utility companies are obliged to enter into a PPA with a Generator who has obtained the required certification and applies for a PPA, unless certain exceptions apply. As for the grid connection agreement, each utility company has posted on its website the standard terms for its the power purchase agreements, which may be negotiated on a project-specific basis. In practice, however, it is not possible to drastically change the standard terms.

Commercial operation deadline

To address the past issue discussed above, of certification being obtained without sufficient resources in place resulting in delayed commencement of operations, the Renewable Energy Law was amended to introduce a deadline for renewable energy projects to reach the commercial operation stage (the Commercial Operation Deadline).

The FIT Term commences from the day following the Commercial Operation Deadline, therefore if a Generator fails to meet the Commercial Operation Deadline, the project will not be able to fully utilise the FIT Term (for example, one month's delay triggers a one-month deduction from the FIT Term). The project will thus directly incur a loss as a result of the delay in commencement. To be specific, the Commercial Operation Deadline shall be (1) three years for solar power projects with an output capacity of 10kW or more; (2) with the exception of item (4) below, four years for wind power, biomass power and geothermal heat projects; (3) seven years for hydroelectric power projects; and (4) eight years period for wind power projects and geothermal heat projects requiring an environmental impact assessment.

The Commercial Operation Deadline applies to solar power projects that enter into grid connection agreements or receive certification by the METI on or after 1 August 2016, and other renewable energy projects that receive certification by the METI on or after 1 April 2018.

To supplement this regulation, a new regulation entered into force as from December 2018. The new regulation applies to solar power projects that are not subject to the Commercial Operation Deadline. More specifically, this regulation applies to solar power projects for which certification was granted between April 2012 and March 2015, and for which grid connection agreements were entered into before 1 August 2016. Under the new regulation, an application for the start of the grid connection construction (GCCA) must be received by the utility company by 31 March 2019, and operations must commence by 31 March 2020 (or, if the GCCA is received after 31 March 2019, one year after the GCCA is received by the utility company).

Other regulations

Electricity Business Act

Under the Electricity Business Act, to construct certain power generation facilities (i.e., geothermal power, hydroelectric power, solar power of 2,000kW or more, wind power of

500kW or more, and biomass power of a certain size, depending on the type), a notification of the construction plan for the power generation facilities must be submitted to the METI in advance.

Before the commercial operation date, a Generator that has submitted a notification of a construction plan must conduct a self-check of its power equipment and report the results to the METI. In addition, to ensure the safety of the maintenance and operation of the facilities, the Generator must (1) establish an internal safety regime and submit details of this to the METI, and (2) appoint a chief engineer, who will be in charge of supervising the safety of the maintenance and operation of the facilities, and notify the METI of his or her appointment.

After the commercial operation date, the Generator shall maintain its felicities to ensure that they conform to the technical standards established by the METI.

Environmental impact assessment and prior consultations

The Environmental Impact Assessment Act applies to projects of 7.5MW or more for wind power projects, of 112.5MW or more for biomass power projects, and of 7.5MW or more for geothermal power projects, but the Act does not apply to solar power projects. It should be noted, however, that the Act is expected to be amended to cover solar power projects of 40MW or more (and solar power projects of 30MW or more, depending on the case). If the Act applies, a survey, forecast and evaluation of the possible environmental changes caused by implementation of the project must be prepared; it will take a considerable time to complete this process and the commercial operation will be affected accordingly.

In addition, some local governments maintain their own environmental impact assessment rules and often require the securing of various permits and licences, depending on the applicable circumstances.

Land-related laws and regulations

There are several laws, including local government rules, that restrict the use of land in certain areas. Under the Crop Land Act, for example, permission from the prefectural governor is required to use land designated for agricultural crops for any purpose other than for crops. Therefore, careful due diligence should be conducted before obtaining project sites.

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

i Project finance transaction structures

Typical project financing structure and principal participants in Japan

In typical renewable energy project financing transactions, a project owner is a special purpose company (SPC). An SPC acquires ownership or leasehold of the project site, builds and operates power generation facilities, and receives the electricity sales proceeds from a utility company under the power purchase agreement.

In Japan, there are two types of limited liability companies that can be used as the SPC: the stock company[3] and the limited company (GK).[4] However, a GK is much more common because (1) it is less time-consuming and less costly to set up, because of its simpler

3 *Kabushiki kaisha.*

4 *Godo kaisha.*

structure, and (2) it is more favourable for lenders in that a GK is not subject to the Corporate Rehabilitation Act, under which foreclosure of collateral may be prohibited. For the purposes of this chapter, it is assumed that the SPC takes the form of a GK.

Lenders usually request that an entity called an *ippan shadan houjin* (ISH) be a member of the GK and manage the GK's operations to eliminate the project sponsor's influence on the GK. The ISH is owned and managed by an independent third party (such as a public accountant) and there are accounting firms that provide professional services to set up and manage the GK and the ISH.

A project sponsor injects equity into the GK by way of a silent partnership (TK),[5] which is explained in detail below. Also, the project sponsor is required to submit a sponsor letter to lenders, in which the project sponsor agrees to directly indemnify the lenders against damages arising in certain events. The scope of the indemnification should be a key point in the negotiation between the project sponsor and the lenders.

The debt finance is provided by lenders to the GK to fund construction costs and operational costs. There are various lenders that may provide the debt finance to renewable energy projects in Japan, including the Development Bank of Japan Inc, commercial banks (such as Mizuho Bank, Ltd, Sumitomo Mitsui Banking Corporation and MUFG Bank, Ltd), trust banks, international banks, regional banks and life insurance companies.

In addition, the following entities play important roles in projects:

a an asset manager to the GK is responsible for the management of the GK's assets pursuant to an asset management agreement (the AM Agreement);

b an operation and management contractor is in charge of operation and management of the facilities pursuant to an operation and management agreement (the O&M Agreement);

c an engineering, procurement and construction (EPC) contractor constructs and delivers facilities to the GK usually on a turnkey basis pursuant to an EPC agreement (the EPC Agreement);

d a utility company purchases electricity from the GK under the PPA; and

e an insurance company provides insurance to cover damage to facilities caused by natural disaster, etc.

Documentation

For renewable energy project finance transactions, the main documents needed consist of finance documents and project documents. Finance documents include a loan or facility agreement, security documents, an inter-creditor agreement if multiple lenders are involved, a sponsor letter, or hedging agreements if an interest rate swap is taken. Project documents include an AM Agreement, an O&M Agreement, an EPC Agreement, a grid connection agreement, a PPA, an EPC Agreement, insurance policies, a lease agreement of the project site if the SPC leases it, or a TK agreement.

Typical debt finance structure and security package

The debt finance is typically arranged such that it is repaid entirely from the cash flows of the project, namely electricity sales proceeds from a utility company. The project sponsor owes

5 *Tokumei kumiai*.

indemnification obligations only to the extent specified in the sponsor letter. The typical tenor for term debt is linked to the FIT Term and thus 18.5 to 20 years in the case of solar and wind power projects.

All the assets and contractual rights and positions of the GK are provided to the lenders as security. In other words, the security package includes mortgages over project sites, assignments as security over facilities, pledges over bank accounts, insurance proceeds and equities (i.e., membership of the GK and TK interests in the GK), and assignments as security over contractual rights and positions set out in project documents.

Equity structure (the TK structure)

The TK structure is unique to Japan. A TK is a contractual and bilateral relationship between two entities (rather than creating a separate legal entity), in which one party (the TK Investor) contributes to the other party (the TK Operator) for the TK Operator's business, and the TK Operator distributes profits earned by the business. In renewable energy financing transactions, a project owner becomes the TK Operator and a project sponsor usually becomes the TK Investor.

The key feature of the TK is that the TK Investor must not be involved in the operation of the business of the TK Operator. In other words, in project finance transactions, it should be ensured that (1) the project sponsor (as the TK Investor) has no rights to administer or operate the business of the GK (as the TK Operator), and (2) the project sponsor (as the TK Investor) has only a passive right to receive distributions of profit from the business of the GK (as the TK Operator).

The TK structure is quite common in renewable energy financing transactions and other project or asset financing transactions, mainly for tax reasons. That is, distributions to the TK Investor are included in the deductible expenses of the TK Operator, thereby reducing the corporate tax to be imposed on the TK Operator. That said, careful analysis should be made in the case of cross-border TK structures in which the TK Investor is not tax-resident in Japan and the TK Investor is not considered to have a permanent establishment in Japan through the TK Operator.

Infrastructure fund market

Investors in renewable energy projects are basically limited to professional corporations who have expertise in these kinds of projects. However, it has been recognised that the scope for suitable investors should be expanded to promote renewable energy projects. In April 2015, the Tokyo Stock Exchange established an infrastructure fund market that enables the listing of funds that invest in renewable energy generation facilities. Currently six funds investing in solar power projects are listed on the market. The market provides opportunities for a broad range of investors, including retail investors, to invest in renewable energy projects and adds an exit option particularly for developers who develop large-scale power generation facilities.

ii Distributed and residential renewable energy

With a view to expanding residential renewable energy, the METI and local governments have taken the following actions in addition to the FIT Scheme.

First, certain local governments subsidise a portion of the cost of installing renewable energy facilities and related equipment. For example, Tokyo Metropolitan Government subsidises the whole cost (up to ¥10 million) of installing solar power generation facilities and related energy storage on residential apartments.

Second, until 31 March 2020, a special tax treatment, which allows for an additional 20 per cent depreciation of the charge due on the facilities, is available for certain biomass power generation facilities.

Third, the Japan Finance Corporation, a wholly owned subsidiary of the Japanese government, may extend loans to fund the installation cost of renewable energy facilities.

While in the past we have seen house or building owners becoming Generators through ownership of solar modules, the rooftop lease arrangement is currently becoming more popular. In this case, the Generator leases the roof and installs its own solar equipment on the roof, then sells the electricity to a utility company under the FIT Scheme. In addition, it is reported that recently more and more local governments are renting the rooftops of public buildings such as schools and public halls to Generators for solar power generation.

iii Non-project finance development

Project companies have been seen to develop renewable energy projects through full equity finance, corporate finance or finance lease. Another, relatively new, structure is crowdfunding. Crowdfunding is a scheme whereby retail investors contribute to a crowdfunding business operator by way of a TK arrangement and the crowdfunding business operator uses the contribution to extend loans to a Generator operating renewable energy projects.

V RENEWABLE ENERGY MANUFACTURING

There are various Japanese companies manufacturing renewable energy equipment such as solar modules, power conditioning systems and biomass boilers. For example, Sharp Corporation and Kyocera Corporation have held certain market shares in solar modules.

However, many non-Japanese renewable energy equipment manufacturing companies are expanding their market share in Japan mainly because of their low prices. According to a report by Nikkei on 9 July 2018, South Korea's Hanwha Q Cells ranked the top in market share of solar modules in 2017 (12.9 per cent), followed by Canadian Solar (12.2 per cent), Kyocera Corporation (12.2 per cent) and China's JinkoSolar (12.2 per cent).

In addition, in relation to wind turbines, Hitachi Ltd and the Japan Steel Works, Ltd announced their withdrawal from wind turbine production in 2019, one after another, and it is thus expected that non-Japanese companies will dominate the wind turbine market in Japan.

VI CONCLUSIONS AND OUTLOOK

After several years of rapid growth of solar power generation following the introduction of the FIT Scheme in 2012, there has been an observable backlash against solar since 2016 and it has been said that the 'solar power boom' in Japan is over. However, it is to be noted that Japan is in a transitional phase, which could be characterised as a process of trial and error. The current FIT Scheme has been greatly improved and solar power projects have become established over the past few years. Solar power projects are expected to continue to constitute the majority of new projects, although more cost-effective approaches will be sought. On the other hand, there is room for growth in wind power projects, and offshore wind power projects in particular, as Japan is an island nation. The newly enacted Act on Promotion of Utilisation of Sea Areas for the Development of Marine Renewable Energy Generation Facilities will play an important role in promoting offshore wind power projects.

Chapter 10

KOREA

Tong Keun Seol, Dong Eun Kim and Sangmin Kim[1]

I INTRODUCTION

The regulatory framework for new and renewable energy in the Republic of Korea (Korea) primarily consists in the Act on the Promotion of the Development, Use and Diffusion of New and Renewable Energy (the Renewable Energy Act). The regulatory framework for renewable energy is intertwined with energy policies established by the Framework Act on Low Carbon, Green Growth (the Carbon Act), the emission trading scheme and the Act on the Allocation and Trading of Greenhouse-Gas Emission Permits (the GHG Allocation Act), which became effective in 2015. The primary government authority responsible for renewable energy-related matters is the Ministry of Trade, Industry and Energy (MOTIE).

The Korean government establishes long-term basic energy plans (the Basic Energy Plan) to promote, among other things, the development, use and diffusion of new and renewable energy. The Basic Energy Plan is published every five years and lays out the country's basic energy policy for the next 10 years.

Since 2012, the government has implemented the Renewable Portfolio Standard (RPS) scheme pursuant to the Renewable Energy Act. The RPS imposes obligations on 21 large power generation companies to generate a certain minimum percentage of gross power generation from renewable energy sources. Failure to meet the obligatory generation quota may result in an administrative fine in the amount equivalent to 1.5 times the average trading price of Renewable Energy Certificates (RECs).

The current renewable generation quota obligations are set out as follows. However, President Moon Jae-in's administration is in the process of revising the ratio and it is expected that ratios will be adjusted to a higher level.

Table 1: annual supply rates

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Ratio (%)	2	2.5	3	3	3.5	4	5	6	7	8	9	10

II THE YEAR IN REVIEW

In June 2018, REC weighting was adjusted to address concerns over concentrated investments in bioenergy compared to other forms of renewable energy. Notably, REC weighting for bioenergy such as wood pellets, chips and bio solid refuse fuel has been significantly lowered or, depending on the type of incineration, partially abolished. In contrast, REC

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weighting for offshore wind farms has been raised to the range 2–3.5 units. In June 2019, the Third Basic Plan for Energy (for the years 2019–2040) was announced by the President Moon administration, whereby the government reaffirmed its energy initiative to phase out nuclear energy and sought to increase the proportion of renewable energy in the total energy supply to 30–35 per cent by 2040, from 7.6 per cent in 2017. Furthermore, in accordance with the Third Basic Plan for Energy, the government is contemplating (1) reducing total energy consumption by 18.6 per cent to 171.8 million tonnes of oil equivalent by 2040, (2) improving energy efficiency by 38 per cent by regulating energy demand by sector, (3) forging agreements with energy-intensive businesses to encourage them to reduce energy consumption, (4) introducing a new fuel efficiency standard for medium-sized to large cars by 2022, and (5) rationalising the energy pricing model by adopting green pricing or implementing corporate power purchase agreements (PPA), among other things. While the government is striving to tackle the problem of fine and ultra-fine dust and to reduce GHGs, its Third Basic Plan has been criticised by some commentators as being unrealistic and lacking detailed measures.

III THE POLICY AND REGULATORY FRAMEWORK

i The policy background

Korea introduced the RPS in 2012, converting from the previous feed-in tariffs (FIT) regime. Additionally, the government required companies with generation capability of 500MW or more to generate at least 6 per cent of gross power from renewable energy sources. Currently, 21 large power companies in Korea are subject to this obligation. However, current policies have been criticised for being disadvantageous to renewable energy companies because the RPS ratios are too low. As new and renewable energy sources are lacking in Korea, some commentators believe that achieving the ratio targets would be practically very difficult. Further, non-governmental organisations (NGOs) and renewable power companies also believe that profitability from renewable energy generation and the predictability of the business are uncertain because the REC price is relatively low and the volatility of the business is quite high. Therefore, some critics are not supportive of pursuing renewable energy business in Korea.

For these reasons, the government has implemented its Korea Power Supply and Development Plan 3020 and MOTIE is in the process of raising the RPS ratio and adjusting RECs in accordance with the government's policy to expand the renewable energy business.

ii The regulatory framework

Main sources of law and regulation and regulators' powers and scope of authority

The main sources of law and regulation in Korea are the Renewable Energy Act, the Carbon Act and the GHG Allocation Act.

Pursuant to the Renewable Energy Act, new energy is described as hydrogen energy, fuel cells, energy from liquefied coal and heavy residual oil, and renewable energy, including solar energy, wind power, water power, marine energy, geothermal energy, bio energy and waste-to-energy.

MOTIE is the primary governmental authority responsible for energy-related matters. Although the Energy Committee also plays a significant part in establishing energy-related policies in Korea, MOTIE is the main agency responsible for establishing and implementing energy policies and plans. Ordinarily, MOTIE will review and set a new Basic Energy Plan

every five years, which lays out the nation's basic energy policy for the next 10 years. These energy policies and plans are reviewed by the Energy Committee and then by a cabinet council consisting of ministers of each ministry. NGOs do not play a formal role in establishing government policies for renewable energy. However, many activists from NGOs have been working and coordinating with the government recently.

Different institutions regulate different sections of law in Korea, as MOTIE delegates various duties to other agencies. For example, Korea Electric Power Corporation (KEPCO) manages REC matters, the New and Renewable Energy Centre is responsible for reviewing and issuing RECs to eligible companies, and local governments have the authority to issue licences for installation of renewable power plants located in their jurisdiction.

Renewable Energy Certificates

Under the Renewable Energy Act, an REC is defined as a 'certificate authenticating the fact of supply by using new or renewable energy facilities'. An REC is based on each megawatt hour (MWh) of electricity generated from a renewable energy resource. RECs are issued by the New and Renewable Energy Centre and are tradable in Korea. RECs are typically sold to one of 21 large power generation companies that are obligated to generate certain percentage of their generation output from renewable energy source.

The renewable energy is monitored by KEPCO, which verifies the amount of renewable energy generated. If a company produces renewable energy, in addition to RECs, the company can also get a certified emission reduction credit for greenhouse gas emissions by registering with the United Nations as a clean development mechanism project.

The renewable energy is integrated into KEPCO's electricity grid network because the electricity generated from the renewable source can be sold only through Korea Power Exchange (KPX). In this regard, the Korean renewable energy producers earn revenue by selling electricity to KEPCO through KPX plus additional income by trading RECs with the 21 large power generation companies.

As at June 2019, renewable energy companies typically generated revenue of approximately 79,000 Korean won per 1Mwh, and 69,000 won per 1 unit of REC. Subject to fulfilment of certain requirements, these entities may also obtain GHG emission rights by generating renewable energy.

Regulatory approval and authorisation

To engage in renewable energy business in Korea, the developer must secure ownership or lease right of the land on which the power plant will be located, and obtain necessary licences from the local government where the land is located. And for large-scale power generation projects (over 100,000kW), an environmental impact assessment must be carried out and approved by the Ministry of Environment.

The time frame for obtaining approval for the development of a utility-scale renewable energy project often depends on the type of renewable source. For example, for onshore wind, the approval process normally takes about four years from filing the application with the government, whereas for solar power, the approval may be granted within a year. In the case of a large-scale project, it may take longer than usual to obtain the approval since it requires an environmental impact assessment.

Special protocols for intermittent energy sources and environmental concerns

In Korea, there are special protocols for intermittent energy sources such as wind and solar. When an energy storage system (ESS) is linked to supplement the intermittent energy, additional REC weighting is given in the range 4–5 units depending on the type of renewable source. The highest weighting (5 units) is given to solar power facilities linked with an ESS.

The government also seeks to secure commercialisation of ESSs and source technologies to reduce ESS prices by 50 per cent of the current price by 2020. The government also plans to develop technologies that enable early commercialisation of non-lithium storage methods, such as redox flow batteries and sodium sulphur batteries, and operation of mid to large-scale energy storage systems of 50MW to 100MW.

Although wind and hydropower are considered renewable energy, the construction of related power plants face difficulties as many environmental organisations and local residents oppose these plants because of potential environmental harm resulting from their construction and operation. In this regard, more investment is made in solar energy because of the comparatively fewer potential environmental problems associated with installation of solar panels in smaller-scale solar projects on parking lots, factories, residential roofs and farmland.

In the case of solar power, small and medium-sized projects seem more promising in Korea. This is primarily because there is limited land space on which large power projects can be built. In recent years, aquatic solar power generation plants have been installed in dams and reservoirs to solve land site problems.

The majority of regions consist of mountainous terrain, and most areas of flat land suitable for solar power projects have been already developed. Accordingly, it is difficult for developers to procure land suitable for solar power projects (i.e., vast areas of flat land with appropriate amounts of solar irradiance). However, once suitable land is procured, financial institutions in Korea have been seen to be willing to invest in such projects as stable income is expected over the long term.

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

i Project finance transaction structures

Project financing transactions in Korea

In renewable energy projects, the project operator typically acquires ownership or lease of the project site, ownership of the renewable energy generation and transmission facilities (including transmission facilities up to the point of interconnection with KEPCO's grid network), and ownership of the electricity sales proceeds and REC sales proceeds. The real property and tangible assets relating to sites and facilities are provided as collateral to the financial institutions that provide the financing. Intangible assets such as electricity sales proceeds, REC sales proceeds and insurance proceeds are also typically provided as collateral assignments to the lenders.

In project finance, the main documents include loan agreements; security documents in respect of the real property, mortgage and equity; pledge agreements with respect to accounts and insurance proceeds; security assignment agreement; and documents regarding disposal of power plants, assignment of licence and approval in the event of default, and credit support provided by majority shareholders. The typical tenor of the term debt is usually from 10 to 15 years.

In Korea, it is common for the contractor that manufactures or installs renewable energy equipment to provide an efficiency guarantee to the lenders. Financing for renewable projects is mainly provided by commercial banks, although it is becoming more common for private equity funds to participate in these types of financing.

The other unique feature of renewable project financing in Korea is that the electricity generated from the renewable energy must be traded in and through KPX. This adds complexity when structuring the project finance, especially in terms of structuring the collateral package, since KPX is a governmental agency.

Environmental attributes market and trends

In Korea, the market for environmental attributes such as RECs has not been active because of various risks and systemic problems. One of the systemic problems is that the regulations relating to renewables (including REC weighting and the mandatory supply ratio under the RPS programme) are not so straightforward and change from time to time at the government's discretion, making the legal landscape less predictable. For example, when it was determined that the original RPS level was unattainable, the mandatory supply ratio was significantly lowered from the initial target of 3.5 per cent to 3 per cent (for 2015) and from 4 per cent to 3.5 per cent (for 2016). To implement a structured RPS system, the government must set up a system that is clear and enforce it in a consistent manner.

Further, there was no significant government programme to help facilitate investment in renewable energy projects. Aside from government subsidies of up to 50 per cent of installation costs for renewable energy equipment (such as solar power), there were no government policies that purported to support low-income and marginalised communities, individuals or rural residences. And up until now, the current government did not rigorously enforce relevant rules and regulations. This may account for the slow development in the renewable energy market. For example, if the government determines that mandatory supply ratios are not being met, the government simply adjusts these ratios without imposing penalties for violations. Until 2016, even when the 21 large energy companies subject to the RPS failed to meet the new and renewable energy ratio requirements, the government delayed imposing any fines. However, this delay was a policy decision, taking into consideration aggravation of the power generation companies' management, rises in electricity prices and the limitations of the renewable energy resources.

Nonetheless, it is expected that the new government will strongly push for the expansion of new and renewable energy. And if the relevant power supply companies do not meet the mandatory ratios, it is anticipated that the government will impose sanctions. The budgets are now allocated by the government for development of agricultural infrastructure, solar and wind power generation projects, development of core technologies for new and renewable energy, energy efficiency projects and trading of emissions.

Further, beginning with the Renewable Energy Act, the government has implemented a low-interest financing support system for businesses that invest in energy-saving facilities and reduce greenhouse gas emissions to streamline energy use and promote greenhouse gas reduction efforts. In addition, Korea has developed a system to provide small-scale renewable energy funding at no cost, and low-interest loans. However, no system exists to fund large-scale renewable energy facilities at present.

When renewables equipment is installed in houses, buildings, local government buildings and social welfare facilities, funding may be provided to businesses that rent out the solar power facilities to the buildings and houses. Further, financial support is provided

for the manufacturers of renewable energy equipment and facilities or the companies that install and operate new and renewable energy facilities. The government also supports the Energy Saving Company (ESCO), which is a company equipped with required facilities, capital and technology and registered with MOTIE pursuant to Article 25 of the Energy Use Rationalisation Act and Article 30 of the Enforcement Decree of the same Act, and which provides loans at lower interest rates than the market rates.

Since 2012, the government has implemented a guarantee system for cooperation agreements for renewables. Under these initiatives, the government uses funds contributed by large corporations, including KEPCO, Samsung Electronics and Hyundai Motors (approximately 103 billion won), to provide loans to renewable energy companies. These loans are guaranteed by the government-owned technology guarantee fund and credit guarantee fund. No government-sponsored green or similar funds have been introduced to facilitate renewable energy projects.

In Korea, financial institutions, such as bankers' associations, commercial banks, insurance companies, brokerage firms and fund management companies have created green finance councils to create and operate financial products and provide loans for new and renewable energy. These initiatives support ESCO projects, guarantees, funds and insurance. These green financial products are just one type of financial support system available, in addition to those described above.

In the renewable energy market, the private power purchase (PPP) market has not yet been developed in Korea because electricity can be sold only through the electric power market in KPX. PPPs are in use, however, with related renewable energy sources, such as incineration of certain waste, and landfill projects, where the government encouraged investors by providing minimum revenue guarantees to promote the business.

ii Distributed and residential renewable energy

The government seeks to encourage small energy projects. More specifically, to enhance and expand new renewable energy sources, the government provides financial support for installation of household generators (3kW or less) and geothermal heat pumps, among other applications. Currently, the government subsidises 50 per cent of the cost of installing new renewable energy equipment in residences and buildings.

Although there is no system or government policy to support the establishment of a renewable energy company in Korea, the government supports renewables facilities on a small scale by offering financial support for residences, buildings and regions to enhance production and usage of new renewable energy. MOTIE also facilitates leasing of solar energy equipment and related facilities under the Ordinance on the Support of New Renewable Energy Facilities.

Ownership structures of distributed (on-site) and residential energy facilities

In the case of a single-family house in Korea, the owner of the house can install and own a distributed and residential energy facility. However, in the case of multi-unit dwellings such as apartments, the approval of the resident representative meeting must be obtained to instal the distributed energy facility on the roof of the building or veranda (in the case of the multi-unit dwelling, the approval of each owner is required). In the case of Seoul, the local governments provide housing subsidies for small, home solar power facilities.

As such, homeowners (co-housing owners or representatives in the case of apartments), local governments and installation companies are the key participants in the distributed energy market.

The local governments are expanding their investment in distributed renewable energy in the form of the One Less Nuclear Power Plant campaign, which is one of the major policies of the government. One of the major concerns for Korea is the strong opposition of environmental groups and local residents to the acquisition of land for power plants and development of large utility-scale renewable projects. This is accounted for in part because Korea is a small country, hence the land scarcity.

iii Non-project finance development

In some cases, the investment in new and renewable energy is made with an individual's or an entity's own capital (rather than using project financing provided by the financial institutions) for the owner developer (rather than the lenders) to secure the GHG emission rights or the RPS. In this case, renewable energy projects are only possible when the ownership or leasehold of the site is secured by that individual or entity.

V RENEWABLE ENERGY MANUFACTURING

In Korea, the solar modules and panels business is relatively more developed than the wind power business. The wind power component industry is relatively less developed than the solar power industry because of the limitations regarding geographical conditions in Korea. In connection with other renewable energy manufacturing, businesses such as photovoltaic parts manufacturing, wind power manufacturing, anaerobic digestion of organic waste, and transmission equipment businesses such as biogas refining, hydrogen production, fuel cell businesses and ESSs are well established in Korea.

To promote and support development of renewable energy or energy-efficient technologies, the government's efforts include providing financial support, promoting technology development projects, standardising technologies and introducing technology certification systems. The government has also reduced tariffs on equipment for the production of renewables. Furthermore, if a company invests in facilities and equipment to produce new and renewable energy materials and related parts, an income or corporate tax reduction of 10 per cent of the investment amount is made available.

The government has also introduced multiple schemes relating to renewable energy, including (1) a renewable heat obligation policy (mandating a certain amount of thermal energy usage to be supplied by renewable energy); (2) a renewable fuel standard policy (mandating oil refiners, importers and exporters to blend a certain amount of renewables in transportation fuel); and (3) installing new or renewable energy equipment in workplaces with massive energy consumption. The government further plans to expand renewable energy by investing in research and development of relevant technologies and expanding financial support, among other measures.

The government is currently carrying out various technological improvements, including developing high-voltage direct current technology, enhancing technological independence, expanding dispersed-type power sources (in-house power generation for areas of business with massive energy consumption), disseminating new renewable energy and developing microgrid technologies, among other measures.

VI CONCLUSIONS AND OUTLOOK

The development of renewable energy projects in Korea is largely driven by government initiatives, such as the RPS scheme, policies and related mandates. The government plans to make significant investments in new and renewable energy going forward. However, significant progress needs to be made to overcome handicaps such as the lack of incentives and scarcity of land.

However, as investments increase and as technologies become more efficient and smaller, we believe that renewable energy use will expand, albeit beginning with smaller installations and improvements. These elements may include solar panel roofs in public highway rest areas and on street lights, panel installations on roofs of public and private buildings, and installations on reservoirs, among others. Thus, the first immediate developments may be realised through less intrusive methods, while development of larger-scale projects will progress more slowly.

Chapter 11

MEXICO

José Antonio Postigo-Uribe, Pedro Palma-Cruz, Luis Orlando Pérez-Gutiérrez and Tania Elizabeth Trejo-Gálvez[1]

I INTRODUCTION

On 20 December 2013, a Mexican constitutional amendment for the energy sector (the Energy Reform) was published in the Official Federal Gazette (DOF). The Energy Reform was an enormous contribution to the development of renewables in Mexico. A principal contribution of the Energy Reform was the establishment of clean-energy obligations and the reduction of polluting emissions by the participants in the electricity industry.

As part of the secondary legislation arising from the Energy Reform, on 24 December 2015, the Energy Transition Law (LTE) was published in the DOF. The LTE regulates the sustainable use of energy, as well as the obligations and goals for clean energies and the reduction of polluting emissions in the electricity industry. The LTE provided for the establishment of the Advisory Council for Energy Transition (the Council), a permanent citizen consultation and participation body whose purpose is to provide opinions and advise the Ministry of Energy (SENER) on the actions necessary to achieve clean-energy targets and energy-efficiency goals.

The main purposes of the LTE include the following:

a to oversee the gradual increase of the role of clean energies in the electricity industry to meet the goals for clean energy generation and emission reduction;

b to facilitate fulfilment, in an economically viable manner, of the clean-energy and energy-efficiency goals set out in the LTE;

c to establish mechanisms to promote clean energy and reduce polluting emissions; and

d to promote the use of renewable resources and waste.

Pursuant to the LTE, the instruments and programmes for planning the national policy on clean energy and energy efficiency are:

a the Transition Strategy to Promote the Use of Cleaner Technologies and Fuels (the Strategy);

b the Special Programme for Energy Transition (PETE); and

c the National Programme for the Sustainable Use of Energy (PRONASE).

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II THE YEAR IN REVIEW

The Strategy, PETE and PRONASE are the leading axes for the promotion and regulation of clean energy in Mexico. The Strategy was published in the DOF on 19 December 2014. The Strategy constitutes the guiding instrument for medium-term and long-term national policy on clean energy. It deals with obligations, sustainable use of energy and reduction of polluting emissions in the electricity industry.

On 2 December 2016, the executive branch of the government published an update to the Strategy in the DOF. The revised Strategy made recommendations on the following topics: energy savings in buildings; energy savings in industry; energy savings in transportation; bioenergy; wind energy; solar energy; geothermal energy; hydropower; and distributed generation.

The main purposes of the Strategy are:

a to establish clean-energy goals and a road map for their implementation;
b to promote the reduction of polluting emissions in the electricity industry; and
c to reduce, subject to criteria of economic viability, Mexico's dependence on fossil fuels as a primary source of energy.

The Strategy has medium-term and long-term planning components, of 15 and 30 years respectively, consistent with international best practices, which define clean-energy goals and energy efficiency. To achieve these goals, the Strategy uses indicators to monitor progress towards energy transition in electricity generation and energy consumption in Mexico.

The PETE is the instrument that implements the actions established in the Strategy, ensuring its economic viability. The PETE 2017–2018 (the latest version) outlined the actions required to meet the goal of generating 25 per cent of the country's electricity from clean sources by the end of the 2012–2018 term of the federal government administration, thereby laying the foundations to achieve the goals of 30 per cent by 2021 and 35 per cent by 2024.

The purposes of the PETE are:

a to increase installed capacity and generation of clean energies;
b to expand and modernise transmission infrastructure and increase distributed generation and storage;
c to promote technological development, talent and value chains of clean energies; and
d to democratise access to clean energy.

On 19 January 2017, the PRONASE 2014–2018 (the latest version) was published in the DOF. On the basis of the policies, actions and targets for energy efficiency set out in the Strategy, the PRONASE establishes objectives, strategies and lines of action to achieve the optimal use of energy in all processes and activities in respect of the exploitation, production, transformation, distribution and consumption of energy.

The PRONASE requires that demand be reduced both in the energy sector and by final consumers, without affecting their productivity and competitiveness, by significantly increasing energy efficiency, introducing new technologies and substantially modifying the way in which the energy is consumed.

III THE POLICY AND REGULATORY FRAMEWORK

i The policy background

Clean energies are not the same as renewable energies. Pursuant to the Electricity Industry Law (LIE), clean energies are those sources of energy and electricity generation processes whose emissions or residues, when they exist, do not exceed the thresholds established in the applicable regulatory provisions. Therefore, clean energies encompass renewable energies.

The LTE defines renewable energies as energies whose sources reside in phenomena of nature, processes or materials susceptible to being transformed into energy usable by human beings, and that regenerate naturally so they are available continuously or periodically; and when generated do not release polluting emissions.

The sources of renewable energy, according to the LTE, are: (1) wind; (2) solar radiation, in all its forms; (3) the movement of water in natural channels or in those artificial channels with existing reservoirs, with systems for generating capacity less than or equal to 30MW or a power density, defined as the relationship between generation capacity and reservoir surface, greater than 10 watts/m^2; (4) oceanic energy in its different forms, namely, tides, marine thermal gradients, marine currents and salt concentration gradients; (5) the heat of geothermal deposits; and (6) the bioenergy sources stipulated in the Bioenergy Promotion and Development Law.

Certain tax benefits may be applicable to those seeking to invest in renewable energies. Special net tax profit account (CUFIN) rules allow a corporation to distribute dividends to its shareholders despite a lack of taxable profits generated at the corporate level.

Mexican corporations must have a CUFIN, the balance of which will be increased by, among other things, the net tax profits received by the corporation, and decreased by the dividends and profits distributed to its shareholders. The net tax profit is the result of subtracting the income tax paid (at a rate of 30 per cent), and other concepts, from the taxable income.

In this regard, Mexican law allows corporations exclusively engaged in (1) energy generation from renewable sources, and (2) efficient electricity cogeneration systems, to have an energy net tax profit account (Energy CUFIN), which relies on the above-mentioned CUFIN rules. The Energy CUFIN follows the same rules as the CUFIN, except that the concept of 'net tax profit' is replaced by 'investment profit', which is the result of subtracting the 'deemed income tax' from the 'deemed taxable income'.

The deemed taxable income is obtained by substituting the accelerated depreciation rate (100 per cent) for the 5 per cent depreciation rate on machinery and equipment for the generation of energy from renewable sources, or from efficient electricity cogeneration. The deemed income tax is the result of applying the 30 per cent tax rate to the deemed taxable income.

As with the CUFIN, to the extent that a corporation holds a positive balance in its Energy CUFIN, it would be able to distribute dividends to its shareholders in an amount equal to that positive balance, withholding 10 per cent on dividends distributed to individuals and to foreign residents. It is also important to note that, as with the CUFIN, any distribution of dividends out of the Energy CUFIN decreases the account balance.

Finally, taxpayers distributing dividends or profits from the Energy CUFIN for investment in renewable energy must keep a cumulative record of the distribution of dividends or profits made in each year.

ii The regulatory framework

Regulatory bodies and clean-energy certificates

The LIE ascribed special value to electricity from clean energies through clean-energy certificates (CELs). CELs are titles issued by the Energy Regulatory Commission (CRE) that certify the production of a certain amount of electricity from clean energy sources and that serve to meet load-centre consumption requirements.

For the acquisition of CELs, the SENER sets requirements to be met by the following mandatory participants: suppliers; qualified users, participants of the market; final users who receive electricity by isolated supply; and holders of legacy interconnection contracts, which includes load centres whose electricity does not come entirely from a clean power plant. These participants are described in more detail below:

a A supplier is a marketer, or holder of a permit to offer electricity, who can represent exempt generators (i.e., small power plants with a generation capacity lower than 0.5MW) in the wholesale electricity market (MEM).

b A qualified user, participant of the market is an end user registered with the CRE to acquire an electricity supply as a market participant.

c A final user who receives electricity by isolated supply is an individual or a company that acquires an electricity supply in its load centres through the generation or importation of electricity for the satisfaction of its own needs or for export, without making use of the National Transmission Grid (RNT) or the General Distribution Grid (RGD).

d Legacy interconnection contracts are defined as interconnection contracts or electricity purchase agreements for small producers, entered into, or to be entered into, under the conditions valid prior to the entry into force of the LIE.

In the first quarter of each calendar year, SENER establishes the requirements for the acquisition of CELs to be fulfilled during the following three years, and may establish requirements for subsequent additional years. Once the requirements for a future year are established, they will not be reduced.

The requirements for the acquisition of CELs are established as a proportion of the total electricity consumed in the load centres. Thus, SENER announced that the CELs requirement for the 2019 obligation period is 5.8 per cent; for 2020 it will be 7.4 per cent; for 2021 it will be 10.9 per cent; and for 2022 it will be 13.9 per cent. A CEL covers the generation of 1MWh of clean electricity.

Failure to comply with the requirements for the acquisition of CELs will be penalised with a fine ranging from six to 50 Units of Measure and Update[2] for each MWh of non-compliance.

SENER establishes the criteria for the granting of CELs in favour of generators that produce electricity from clean energies. To be considered a clean generator, the following requirements must be met:

a the generated energy must come from a source of clean energy in terms of the LIE; and

b the power plant must fall into one of the following categories:

- clean power plants that came into operation after the entry into force of the LIE;

2 The value of 1 Unit of Measure and Update is currently 84.49 Mexican pesos.

- legacy power plants[3] that generate electricity from clean energy and entered into operation before the LIE came into effect, provided they have carried out a project to increase their production of clean energy; or
- clean power plants with capacity that has been excluded from a legacy interconnection contract to be included in an interconnection contract under the terms of the LIE during the period in which the holder of the contract had the right to include that capacity in the legacy interconnection contract.

The CRE is in charge of granting the corresponding CELs, validating and certifying their ownership and verifying compliance with the obligations for the acquisition of CELs.

Likewise, the CRE is in charge of creating and maintaining a certificate register, which must include a record of each certificate, as well as information as to its date of issuance, validity and owner history. Only the most recent holder of the CEL entered in the registry may make use of it to demonstrate compliance with CEL requirements.

The System for Clean Energy Certificate Management and Compliance with Clean Energy Obligations (S-CEL) is the platform through which the CRE carries out the management and recording of the information associated with the consumption and generation of electricity, emissions, transactions, and liquidation and voluntary cancellation of CELs, as well as fulfilment of CELs obligations.

The persons obliged to register with the S-CEL are mandatory participants, clean generators wishing to be granted CELs, suppliers representing distributed clean generation[4] that wish to be granted CELs, and voluntary entities.[5]

The means for carrying out transactions in CELs in Mexico are: (1) long-term auctions; (2) bilateral contracts; and (3) the secondary market of CELs organised by the National Centre of Energy Control (CENACE).

Long-term auctions

Long-term auctions are a mechanism that allows any load-centre representative to enter into contracts competitively to meet the demand for CELs, power and capacity. The term of the contracts (electricity coverage contracts) awarded through these long-term auctions will be 20 years for CELs.

To date, three long-term auctions have been carried out. In the first auction, with 17 offers from 11 companies, 5,380,911 CELs were awarded at an average price of US$47.7 per package (MWh plus CELs). In the second auction, with 29 offers from 21 companies, 9,275,534 CELs were awarded in contracts with an average price of US$33.7 per package (MWh plus CELs), 30 per cent lower than that obtained in the first auction. In the third

3 A legacy power plant is defined as a power plant that, upon the entry into force of the LIE, is not included in a permit to generate electricity under the modality of self-supply, cogeneration, small production, independent production or continuous own use, and (1) is owned by the agencies, entities or companies of the state and is in operating condition; or (2) its construction and delivery has been included in the federal budget in the form of direct investment.

4 Distributed clean generation is the distributed generation from clean energies. In turn, distributed generation is the generation of electricity that is performed by an exempt generator and in a power plant that is interconnected to a distribution circuit that contains a high concentration of load centres.

5 A voluntary entity is an individual or a company that is not subject to compliance with clean-energy obligations, but decides to participate in the S-CEL to be the owner of CELs and be able to buy them, resell them or voluntarily cancel their validity.

auction, 5,762,647 CELs were awarded, and the average price obtained was US$20.57 per package (MWh plus CELs), 38.5 per cent lower than the price obtained in the second auction and recognised as one of the lowest prices in the world. The fourth auction was suspended by CENACE, but, according to statements by the head of SENER, Rocío Nahle, it is expected to be reactivated in the future.

Bilateral contracts

A bilateral contract is an agreement the terms and conditions of which will be established freely and voluntarily by the parties to the agreement.

CELs secondary market

The secondary market of CELs allows transactions between any load-centre representative whose CELs obligations are not covered or exceeded by electricity coverage contracts, generators whose operational capacity does not allow them to meet their contractual CELs obligations, and generators with capacity surplus to their commitments.

Regulatory approvals

To develop a renewable energy project within the Mexican energy regulation framework, approvals are required from the CRE and the CENACE.

The CRE is responsible for regulating and promoting the efficient development of electricity generation, public services of electricity transmission and distribution, electricity transmission and distribution that is not part of the public service, and commercialisation of electricity, whereas the CENACE is a decentralised public body whose purpose is to exercise operational control of the National Electric System (SEN) and operation of the MEM, and to guarantee impartiality in the access to the RNT and the RGD.

To develop a Mexican renewable energy project, the following approvals are required:

a generation permit, issued by the CRE; and

b interconnection application approval by the CENACE (subject to indicative, system impact and facilities studies conducted by CENACE, the granting of a financial guarantee by the applicant and the execution of an interconnection agreement by and between the transporter or distributor and the applicant).

As mentioned above, these are the approvals required under the regulatory framework for energy. There are, however, additional development-related requirements, such as evaluation of environmental and social impacts, and regulatory compliance regarding land use, constitution of easements or rights of way, water supply and wastewater discharge, and change of land use in forestland, among other matters, depending on the specific features of each project.

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

i Project finance transaction structures

Project finance is one of the structures implemented to finance electricity industry projects in Mexico. The institutions that provide financing for renewable energy projects, especially on infrastructure, are international commercial banks, as well as local commercial and development banks, in combination with multilateral and import-export agencies.

The typical security structures used for renewable energy projects in the Mexican jurisdiction include contracts and security interests (e.g., pledges, mortgages and trusts). Those structures are contained in agreements that are required to be formalised regularly by a notary public and registered with the Public Registry of Property and Commerce to be perfected. In general terms, liabilities of project company shareholders only extend up to the amount of their contributions to the capital stock of the company.

Since 2015, through its German Climate Technology Initiative (DKTI), the German government has been supporting Mexico in implementing the Solar Energy Program Mexico (DKTI Solar) to help develop solar energy on a large scale in the country. DKTI Solar aims to improve the technological, financial and organisational conditions for the large-scale use of solar energy (photovoltaic and thermal) in the production of energy. To expand the deployment of solar energy in Mexico, the programme activities are concentrated in four areas: policies and regulations, technological innovation, market development, and training for financial institutions.

The financial institution training consists in preparation of commercial and development banks on the opportunities, models and risks related to solar energy. DKTI Solar has provided technical assistance on these issues to the national bank of foreign trade, Bancomext, to improve its solar-energy project evaluation processes, resulting in a greater number of funded projects.

ii Distributed and residential renewable energy

In the past few years the appetite for distributed and residential renewable energy projects has increased dramatically in Mexico and, statistically, is expected to continue to grow steadily for the next five years. Information from the CRE shows that as at the end of 2018, there have been 65,337 contracts for distributed generation, representing an installed capacity of 445.21MW. The three most significant states in terms of distributed generation are the state of Mexico, with 4,380 contracts representing 74.83MW of installed capacity, the state of Jalisco, with 17,097 contracts representing an installed capacity of 88.86MW, and the state of Nuevo León, with 11,045 contracts representing an installed capacity of 91.34MW. The main technologies employed for distributed generation are biofuels (0.58 per cent), wind (0.01 per cent) and photovoltaic solar (99.6 per cent).

In Mexico, distributed generation is meant to have open and not unduly discriminatory access to the RGD, as well as access to markets where the production can be sold. Mexican law considers energy generated by an exempt generator to be distributed generation. The Mexican general administrative provisions applicable to distributed generation and clean distributed generation power plants allow users to generate their own energy for their own consumption and any energy generated in excess to be sent to the RGD; the final balance due for the billing period should then be calculated from the difference between the energy generated and the energy consumed from the Federal Electricity Commission (CFE). If there is a difference in favour of the user, the CFE should pay the user for the energy at the local marginal price (which includes transportation and distribution costs).

iii Non-project finance development

In Mexico, renewable projects have also been developed through non-project finance structures, so the participation of commercial banking has been fundamental for these non-project finance developments. Commercial banks have resorted to different schemes, such as guarantees granted by a development bank.

Also, other financial instruments such as real estate trust bonds may be used for private funding of energy projects, with the placement of real estate fund bonds in the Mexican stock market.

Other non-project finance structures include the use of federal funds created by the Mexican government in light of the LTE, such as the Fund for Energy Transition and Sustainable Use of Energy (FOTEASE), which is a SENER public policy instrument the objective of which is to implement actions to contribute to the fulfilment of the Strategy, promoting the use, development of and investment in renewable energy and energy efficiency. Also, the Electric Energy Savings Trust (FIDE) has supported more than 2,000 distributed generation projects, mainly photovoltaic systems, in the domestic sector, in micro and small businesses, and in efficient cogeneration located at the consumption site. FIDE has contributed approximately US$22 million, resulting in more than 17MW of aggregate installed capacity, with economic benefits to users, increased competitiveness and contributing to the reduction of polluting emissions in the environment.

V RENEWABLE ENERGY MANUFACTURING

A lot of the equipment used for the wind and solar energy industries is produced in Mexico. For example, among other related equipment for wind energy, Mexico produces generators for turbines, steel towers, wind shovels and bearings. For solar energy, Mexico has manufacturing companies that supply the local and foreign markets with photovoltaic solar modules.

It is important to note that as a general rule Mexican corporations are allowed to make deductions against investments through the application in each taxable year of the maximum percentages allowed by the law over the original amount of the investment (straight-line depreciation), where fixed assets, among other items, are considered to be investments.

To foster investments in clean energy generation, the law allows a 100 per cent depreciation (accelerated depreciation) of the original investment on machinery and equipment for the generation of energy from renewable sources or from an efficient electricity cogeneration.

The aforementioned deduction percentage is applicable to the extent that the machinery and equipment operates and functions for a minimum of five years after its acquisition. Otherwise, the accelerated depreciation benefit must be reversed and replaced by the applicable depreciation percentage, resulting, in all likelihood, in a tax payment for the difference in depreciation rates.

Depending on the value of the investment, the corporation investing in machinery and equipment for the generation of energy from renewable sources might not pay income tax for some years because of the application of the accelerated depreciation benefit.

This effect results in a partial benefit. On the one hand, no income tax becomes payable, but on the other the net operating losses, generated for a number of years because of the application of the accelerated depreciation, do not allow dividend distributions to shareholders, since no profits have been generated at the corporate level. Therefore, the accelerated depreciation benefit must be combined with the special CUFIN rules (see Section III.i, above).

In addition, an income tax benefit is granted to taxpayers for their investments in power supply equipment for electric vehicles. The benefit consists in a 30 per cent tax credit on the amount of the investment. To obtain the tax benefit, the equipment must be fixed in public places. If the tax credit exceeds the income tax due, taxpayers may carry forward the remaining credit for the following 10 taxable years until it is exhausted.

VI CONCLUSIONS AND OUTLOOK

According to the information presented during the first and second ordinary sessions of the Council in 2018, clean energy generation reached 24.12 per cent (40,499.01GWh) of total generation – less than one percentage point short of reaching the LTE goal of 25 per cent by the end of 2018. The results from the annual evaluation of the Strategy, PRONASE and PETE indicate that photovoltaic solar energy grew by more than 1,300 per cent over four years, and wind energy grew by 154 per cent in the same period. This is mainly due to two relevant factors: the carrying out of long-term auctions and the implementation of a CELs market.

During the first half of 2018, Mexico had a total installed capacity of 75,918.42MW, of which 23,874.92MW came from clean technologies, representing 31.45 per cent of the total and showing a growth in installed capacity for clean technologies of 11.84 per cent compared to installed capacity at the end of the first half of 2017. Photovoltaic technology showed the highest growth in 2018, as capacity increased by almost three times that of the first half of the previous year, to 1,200MW.

During the first six months of 2018, the first phases of six of the winning long-term auction projects came into operation (five from the first auction and one from the second), with a total capacity of 1,442.5MW from four photovoltaic plants (1,274.5MW) and two wind farms (168MW). These six projects represent 20.64 per cent of the total capacity commitments from the auctions. Over the coming months, an additional 358.7MW will be installed (263MW of photovoltaic and 95.7MW of wind power). This additional capacity will cover 25.77 per cent (1,801.2MW) of the capacity commitments from the first three long-term auctions.

In addition, Mexico has abundant geothermal resources. The country's estimated geothermal potential is 13.4GWe, which is among the highest in the world. As at November 2018, 28 exploration permits have been granted, 13 to the CFE and 15 to private companies, as well as six concessions to exploit geothermal resources; notably, the first concession was granted to a private developer.

However, there are several factors that can limit the development of this type of project, such as the need for intensive capital investment in its initial phase, coupled with the risks associated with deep exploratory drilling because of uncertainty about the capacity of the resource. Therefore, the Mexican Geothermal Program (PGM) has been conceived as an alternative way to finance project execution, associated implementation costs and the technical assistance necessary for new geothermal projects. The PGM has proved to be an innovative financial mechanism of great significance in promoting the development of the Mexican geothermal industry, given that currently installed capacity amounts to 936.2MW, contributing almost 2 per cent of the country's total annual electricity generation.

According to the planning exercise for the National Electricity System Development Programme (PRODESEN) 2018–2032 (the latest version published, since an updated version was expected to be published in May or June 2019), to supply the SEN electricity demand during the period 2018–2032 and to meet clean-energy objectives, 66,912MW of additional capacity will be required, which means 1.7 trillion Mexican pesos in investment over the next 15 years.

Conventional technologies will provide 45 per cent of this additional capacity and 55 per cent will come from clean technologies. Within the clean technologies, a diversified portfolio of projects is expected, of which wind, solar, nuclear and efficient cogeneration will contribute a greater share than other clean technologies.

External factors that hinder the development of clean technology projects, especially in the southeastern region of the country, such as the presence of environmental, social, logistical and financial restrictions, may limit the diversification of the energy mix.

Notwithstanding existing barriers, the current government's objectives in energy matters are to increase investments in renewable sources, achieve energy efficiency and collaborate in the fight against climate change. In this context, the government recently announced an agreement with the Canadian company Hydro-Québec to modernise 60 Mexican hydroelectric plants, increase energy production and reduce the cost of household electricity. We expect the current obstacles to generation of energy from renewable sources to be overcome by the government to meet its objectives.

Chapter 12

NIGERIA

Dolapo Kukoyi, Nnenda Hayatuddini and Victor Samuel[1]

I INTRODUCTION

i Overview of renewable energy project development and law

Nigeria is a gas-rich nation with proven natural gas reserves estimated at 180 trillion cubic feet, making it the ninth-largest in the world according to the US Energy Information Administration's international energy statistics. However, gas production and utilisation has been hindered by several challenges, including a lack of adequate infrastructure to effectively monetise the abundant gas resources, an uncertain regulatory framework and a weak domestic gas market due largely to illiquidity of the power sector, its biggest local major offtaker. Power generation in Nigeria is mainly from hydro and gas-fired thermal power plants, with the hydro plants providing 2,380MW (approximately 16.7 per cent of the total generation capacity) and the thermal plants 10,142MW (approximately 83.3 per cent of the total generation capacity).[2]

In view of the aforementioned challenges, there is a significant need to supplement gas-fired power plants with renewable energy, and on-grid power with off-grid renewable solutions. The Nigerian renewable energy market, however, remains largely in its nascent state, although renewable energy project development has been ongoing in Nigeria for nearly two decades.

Historically, Nigeria's main source of renewable energy has been hydropower plants. Over the years, this has gradually evolved to include other sources such as solar – predominantly through small solar street-lighting projects and the current trend for distributed energy or stand-alone solutions. This progressive shift has led to the emergence of small-scale solar solutions for residential, commercial and even industrial users, including banks (solar-powered automated teller machines (ATMs)), petrol stations and mini grids.

In a bid to support the efforts of the Nigerian government and the private sector, international development finance institutions (DFIs), such as the United States Agency for International Development (USAID), the UK Department for International Development (DFID), and GIZ[3] under its Nigeria Energy Support Program (NESP), have contributed to the growth of renewable energy development in Nigeria.

At present, USAID is implementing the Nigeria Power Sector Program (NPSP), a five-year programme with the main objective of increasing electricity availability and access

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2 https://www.usaid.gov/powerafrica/nigeria.

3 Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH is a provider of international cooperation services for sustainable development and international education work.

by strengthening the enabling environment for private sector investment in the power sector, including the development of business and consumer markets for off-grid solutions, with particular focus on solar home systems, mini-grids and microgrids.

The US government through the USAID Power Africa programme supports the development of the energy sector through credit enhancements, grants, technical assistance and investment promotion efforts. To date, over US$700,000 in grants has been awarded to entrepreneurs for innovative, off-grid energy projects in Nigeria.

The Solar Nigeria Programme, undertaken by the Nigerian government in collaboration with DFID, was put in place in 2014 to provide solar power to public health and education facilities. The Programme provides credit facilities, grants and technical assistance to companies operating in the solar market. The Programme led to the development of a 5MW solar power project in Lagos, supplying electricity to 175 secondary schools and 11 primary healthcare centres within the state. DFID in collaboration with the Kaduna state government, in 2017, launched the Northern Social Project, an initiative to provide uninterruptible electricity to 34 primary health centres in the state via solar systems generating between 5KW and 25KW of power.

Also, the European Union and the German government, through the NESP (implemented by GIZ in collaboration with the Federal Ministry of Power, Works and Housing (FMPWH)), support the development of solar mini-grid projects in Nigeria. During the first phase of the NESP (2013–2017), five state governments were supported in the design and implementation of mini-grid tenders for partial grants, which resulted in the provision of access to electricity to more than 10,000 rural dwellers through five off-grid solar mini-grids, with an aggregate capacity of more than 400kW and operated by selected local project developers.

In the second phase of the NESP, which commenced in January 2019, one-off partial capital in-kind grants, in the form of electricity supply equipment, will be given to selected bidders to design, construct, commission, operate and maintain isolated and interconnected mini-grids across the six geopolitical zones in Nigeria.

In the fourth quarter of 2018, the World Bank, in collaboration with the federal government and the Rural Electrification Agency (REA), commenced the Nigerian Electrification Project (NEP). The project is a US$350 million facility from the World Bank to the Nigerian government for off-grid development, with the objective of increasing electricity access for households, for micro, small and medium-sized enterprises (MSMEs), and for students and patients at federal universities and university teaching hospitals throughout Nigeria. NEP has four components: solar hybrid mini-grids for rural economic development; stand-alone solar systems for homes, farms and enterprises; power systems for public universities and teaching hospitals; and technical assistance.

ii Key trends in the Nigerian renewable energy market

The following are recent trends in the renewable energy market over the past couple of years.

Increasing access to power via renewable energy solutions

An estimated 27.9 million households and 10.6 million small and medium-sized enterprises (SMEs) have a critical need for access to electricity in Nigeria.[4] With this demand projected to nearly double in the next 10 years, amid rising population density and more consumers having to rely on self-generation using firewood, kerosene, petrol and diesel to supplement their power needs, access to proven and cost-effective solutions are more crucial than ever. With reliance on alternatives (primarily diesel generators) coming at a high cost, consumers (both residential and commercial) are seeking cleaner and cheaper energy sources to supplement their power needs. This has led to the emergence in Nigeria of a number of businesses and non-profit organisations focused on developing projects and products aimed at increasing access to power for homes, communities and businesses.

Activities of non-profit organisations and pressure groups

Both local and international non-profit non-governmental organisations (NGOs) and pressure groups have over the years played a prominent role in promoting the development of renewable energy in Nigeria. These NGOs have been able to support the growth of the sector through capacity-building, provision of financing, and promoting public awareness.

All On Partnerships for Energy Access Limited (All On) is a Nigerian off-grid energy investment company that, among other services, provides risk capital, project development support and funding to energy companies in the form of equity investment and grants. Some of the prominent projects All On has engaged in include investing in Lumos Global BV, a global off-grid solar company operating in Nigeria, and the provision of equity and debt funding to Green Village Electricity, Nigeria's leading mini-grid player, for expansion.

In a bid to support clean energy investments in Nigeria, the NESP was created in 2013 with funding from the European Union (EU) and the German Federal Ministry for Economic Cooperation and Development. Since its inception, the NESP has supported: policy development by collaborating with the federal government to establish a clean energy department at the federal Ministry of Power; rural electrification by developing the Mini-Grid Regulation subsequently issued by the Nigerian Electricity Reform Commission (NERC); and capacity development through its training courses in partnership with the National Power Training Institute of Nigeria, particularly in rural regions of Nigeria.

The NESP further promotes the development of mini-grids in underserved and unserved areas in Nigeria by providing in-kind capital grants to mini-grid developers.

The NEP is also designed to promote investment in off-grid energy developments by providing subsidies and performance-based grants to developers.

Front-runner solar power purchase agreements

In 2016, Nigerian Bulk Electricity Trader (NBET), for the first time, signed power purchase agreements (PPAs) valued at US$2.5 billion with 14 developers to purchase 1,125MW of solar energy, to be provided to the national grid.

4 'Nigeria: Energy needs assessment and value chain analysis' (2017), published by All On Partnerships for Energy Access Limited.

Unfortunately, since the agreements were signed, progress in the execution of the project has been slower than expected because of various issues, including inconsistencies in agreements on tariffs between project developers, NBET and the Federal Ministry of Finance, who would be backstopping the put–call option agreements (PCOA), and on indemnities issued by the federal government. The degree of insolvency in the sector has affected the willingness of the World Bank to provide Partial Risk Guarantees (PRGs) (though a number of projects had been nominated), which are required by both equity and debt providers. This has also delayed the flow of concessionary financing required by these projects, given the high costs and patient capital required.

State government initiatives

In December 2018, Kaduna state government signed a memorandum of understanding with a clean energy development company in connection with the development of a 30MW solar photovoltaic plant.[5] Nasarawa state government also signed a PPA with Kuber Power Limited in connection with the proposed development of a 200MW solar power generation plant in the state's capital city.[6] The proposed 200MW solar power plant, upon completion, is expected to be one of the biggest solar power plants in Africa.

Influx of solar lighting and cooking appliances, home systems and stand-alone solutions

The Nigerian energy space has in recent years experienced an influx of solar stand-alone solutions – the most prominent of these being the Lumos Smart Solar System, which launched successfully in 2016. MTN Lumos, which is a partnership between MTN, Nigeria's largest mobile network, and renowned solar experts Lumos, has attracted over US$40 million in foreign investment. Also, in 2016, Arnergy Solar Limited introduced the Arnergy Solar Rental Systems, designed to provide electricity for rent to consumers in off-grid communities.

In 2017, the Azuri Quad off-grid solar technology was launched as a solar programme in partnership with the Niger Delta Power Holding Company, a company fully subscribed to by the government to deliver 20,000 solar home systems to rural households living without electricity.

As of January 2019, the Rural Electrification Fund implemented by the REA signed agreements for the disbursement of a grant of 1.9 billion naira for the execution of mini-grid and solar home power projects in rural communities. The projects are expected to be deployed by 2020.

iii Role of government agencies and authorities in fostering the development of renewable energy projects

Government participation in the Nigerian renewable energy market has been minimal, limited mostly to making policies intended to encourage renewable energy project development. However, the Minister of Power, Works and Housing, Babatunde Fashola, in 2016, released a Road Map for Steady, Incremental and Uninterrupted Power Supply, which reinforced the government's readiness to actively participate in renewable energy projects and to increase

5 https://nipc.gov.ng/2018/12/12/kaduna-state-to-develop-30mw-solar-pv-plant/.

6 https://www.nasarawastate.gov.ng/biggestsolar.php.

generation capacity in the country by the use of renewable energy sources, including solar, wind and hydro. One of the planned projects under the road map includes a 10MW wind farm project to be located in Katsina State.

Also, in 2016, the National Council on Power approved the National Energy Efficiency Action Plan, which sets out the strategy for achieving Nigeria's electricity vision of attaining 30,000MW of power by the year 2030 with at least 30 per cent renewable energy in the electricity mix. If the government, relevant agencies and stakeholders follow through with this plan, the renewable energy market in Nigeria will experience unprecedented growth.[7]

In 2017, the federal government with the assistance of the World Bank Group developed the Power Sector Recovery Program (PSRP), a policy initiative aimed at improving the reliability of the power sector in a bid to boost Nigeria's economic prosperity. In February 2019, the federal government released a restatement of the PSRP, re-emphasising its commitment to, among other things, implementing off-grid renewable energy solutions aimed at providing electricity supply to rural communities. Renewable energy development initiatives have been undertaken by the following government agencies and parastatals.

Federal Ministry of Power, Works and Housing

In May 2019, the FMPWH awarded a 10-year concession to Proserve Energy Services Limited for a 750KW solar power system to supply power to the FMPWH building in Abuja.

The FMPWH is also in the process of awarding concessions for five small and medium-sized hydropower plants to private entities. The dams include the 6MW Ikere Gorge Dam in Ekiti State, the 2MW Omi-Kampe Dam in Kogi State, the 300KW Zobe Dam and 4MW Jibiya Dam in Katsina State, and the 3MW Bakolori Dam in Zamfara State. The objective of the proposed concessions is to ensure an increased power supply.

In addition, the FMPWH is the process of awarding concessions for solar power plants to successful bidders in Sokoto State on a design-build-operate-transfer basis.

Rural Electrification Agency

Flagship initiatives of the REA include:

a the NEP (in collaboration with the World Bank – see Section I.i), aimed at providing access to electricity to households and MSMEs in off-grid communities through renewable energy sources. Components of the NEP include solar hybrid mini-grids and stand-alone solar systems;

b the Energising Economies Initiative, aimed at providing power to selected economic clusters using renewable mini-grid technology to meet current and future supply requirements with a high level of power reliability for economic growth;[8]

c the Energising Education Programme, aimed at providing power supply to 37 federal universities and seven university teaching hospitals across the country, with both projects focusing on adopting renewable energy mini-grid technology. Phase 1 is to be completed in 2018 and will provide power to nine institutions, benefiting over 300,000 students and staff. Seven of the nine planned power plants (10.5MW out of a total of 26.56MW) will be powered by solar energy, in line with the federal government's energy-mix policy; and

7 National Energy Efficiency Action Plans (NEEAP) (2015–2030).

8 http://rea.gov.ng/energizing-economies/.

d establishing an energy database to provide data on key indicators, such as on-grid infrastructure, off-grid infrastructure, population statistics, availability of resources, and statistics on existing and upcoming amenities that require energy.

Federal Ministry of Environment

In fulfilment of Nigeria's obligation to the United Nations Framework on Climate Change, the Federal Ministry of Environment (FMoE) initiated the Renewable Energy Programme in 2016,[9] aimed at improving the viability of the Nigerian renewable energy market to attract capital to develop renewable energy technologies in Nigeria.

Federal Ministry of Science and Technology

The Federal Ministry of Science and Technology has a Renewable and Conventional Energy Technology Department (RCET), which supports the growth of renewable energy in Nigeria through research and development initiatives. The RCET collaborates with the Energy Commission of Nigeria (ECN) on projects aimed at improving the indigenous growth of renewable energy projects.

Energy Commission of Nigeria

The ECN, like the RCET, contributes towards the growth of Nigeria's renewable energy market through its research and development initiatives, which have led to the establishment of research centres across the country.

iv Legal framework for renewable energy project development.

The following policies and pieces of legislation provide a broad outline of the legal framework for Nigeria's renewable energy market.

Legislative enactments

Electricity Power Sector Reform Act (federal enactment, 2005)

The Electricity Power Sector Reform Act (EPSRA) is the principal piece of legislation governing Nigeria's power sector. The EPSRA provides for the establishment of NERC and the REA, including licensing provisions and the regulation of the generation, transmission, distribution and trading of electricity in Nigeria.

Environmental Impact Assessment Act (federal enactment, 1992)

The Environmental Impact Assessment Act (the EIA Act) makes it mandatory for an EIA to be conducted for projects that are likely to have significant effects on the environment, including power projects. A power developer seeking to carry out power generation through the use of renewable energy must register the project with the FMoE for an EIA. The FMoE shall determine the level of the EIA required for each project on a case-by-case basis. In some cases, the FMoE may determine that a full-scale EIA is not required, and may only require a project developer to prepare an environmental management plan (EMP).

Note that the submission of an EIA Approval Certificate or an approved EMP is mandatory for an application for a generation licence from NERC.

9 http://environment.gov.ng/clean-energy-initiatives/.

Nigerian Electricity Management Services Agency Act (federal enactment, 2015)

The Nigerian Electricity Management Services Agency (NEMSA) is responsible for the enforcement of technical electrical standards prescribed by NERC, including the testing and certification of electrical installations, electricity meters and instruments.

NERC Regulations

NERC Mini-Grid Regulation (2017)

The Mini-Grid Regulation is aimed at accelerating electrification in unserved and underserved areas – principally but not restricted to rural areas. The regulation is limited to distributed power of up to 1MW.

NERC Renewable Energy Feed-in Tariff Regulations (2015)

The Renewable Energy Feed-in Tariff (REFIT) Regulations aim at enhancing the attainment of the national targets on renewable energy-sourced electricity and encourage as well as support greater private sector participation in power generation from renewable energy technologies.

Policies

National Electric Power Policy (Electric Power Implementation Committee, 2001)

The National Electric Power Policy outlines the framework for the power reform agenda in Nigeria. It also sets a target of a 10 per cent renewable energy mix for all new connections by 2020.

Nigerian National Energy Policy (Electric Power Implementation Committee, 2003)

The Nigerian National Energy Policy acknowledges the importance of the different renewable energy sources and how they can be effectively utilised. However, no concrete targets for renewables have been set.

Renewable Energy Master Plan (ECN, 2005)

The Renewable Energy Master Plan (REMP) encourages the integration of renewables (with particular emphasis on solar energy). The REMP advocates an increased supply of renewable electricity, from 13 per cent of electricity generation in 2015 to 23 per cent in 2025 and 36 per cent by 2030. The REMP has yet to be signed off by the government or formulated into a law governing renewable energy development.

Renewable Energy Policy Guidelines (Ministry of Power, 2006)

The Renewable Energy Policy Guidelines (REPGs) articulate policy goals for the development of off-grid independent renewables systems and the setting up of a Renewable Electricity Trust Fund (RETF), as well as cost-effective measures to accelerate renewable projects. The REPGs also include incentives for investors by way of a five-year tax holiday.

The Renewable Electricity Action Programme (Ministry of Power, 2006)

The Renewable Electricity Action Programme (REAP) sets out a road map for implementing the REPGs and RETF and further sets out development targets for technology and application. As yet there has been no evident implementation of the REPGs and the REAP.

National Renewable Energy and Energy Efficiency Policy (Ministry of Power, 2015)

The National Renewable Energy and Energy Efficiency Policy (NREEEP) was issued by the federal government to foster power generation through renewables and energy efficiency capacity by 2020. The NREEEP was developed as a robust policy document to consolidate the objectives of the aforementioned policies.

II THE YEAR IN REVIEW

i Recent developments in renewable energy law

Changes in administrative practice in relation to renewable energy projects

Increased duty on solar panels and components

The Nigerian Customs Service recently reclassified solar components and equipment under Harmonised System (HS) Code 8501, which caters for direct current generators, thereby attracting a 5 per cent import duty and 5 per cent VAT charge on all solar panels, modules and components imported into Nigeria (including bypass diodes, inverters, etc.). This is a radical change from the zero per cent import duty rate provided under the previous classification,[10] which stipulated that the import duty on solar panels should be zero per cent.

By virtue of the foregoing reclassification, solar panels imported for the purpose of power generation will be classified under HS Code 8501, while panels imported for any other purposes that do not include component parts for electricity generation, such as inverters or bypass diodes, will be classified under HS Code 8541, which is the classification for photovoltaic cells made up into modules not for power generation.

This change is further heightened in view of the existing 20 per cent duty imposed on deep-cycle batteries, which already makes solar energy installation expensive. The new duty may hinder the importation of solar components and also lead to a commensurate increase in the cost of projects and stand-alone solutions, which in turn could have a devastating effect on Nigeria's solar market, currently valued at 18 billion naira.

However, there is currently a bill (the Zero Percent Import Duty for Renewable Energy Technologies Bill) before the National Assembly, sponsored by a member of the House of Representatives, that is aimed at establishing a special task force within the Nigeria Customs Service to allow for tax and duty exemptions on renewable energy technologies.

NEMSA certification for bidding for power projects

The NEMSA Act provides that no person shall be allowed to undertake electrical installation work on any premises unless that person is duly certified by NEMSA. To this effect, NEMSA issues certifications for contractors looking to engage in the business of electrical installations.

The NEMSA certificate is fast becoming one of the compulsory tender documents for contractors looking to bid for power projects in Nigeria. All projects envisaged by the REA in line with its mandate under the EPSRA require contractors to provide, among other documents, evidence of registration with NEMSA as a licensed contractor in the power sector.

10 Nigerian Customs Common External Tariff Code 541.4010.00.

Hydropower construction licences

In view of the federal government's objective to diversify the power sector, the Nigeria Integrated Water Resources Management Commission in March 2019 announced that it had issued 21 licences to stakeholders, including the companies Nestlé Waters and Winners Power Garden, for hydropower generation and other water-related activities.

ii Recent trends and market activity

In December 2017, the US African Development Foundation (USADF) and All On announced the creation of a 15 million-naira partnership with the goal of expanding access to energy for underserved and unserved markets in Nigeria. In line with the trend of expanding energy access, MTN Lumos, in a bid to build on the success of its operations in the Nigeria energy market, is in the process of raising addition capital to the extent of US$200 million.

In the first quarter of 2018, Rensource, a renewable energy provider, was able to raise US$3.5 million through a round of investments led by Mauritius-based Amaya Capital Partners, with participation from Omidyar Network and Pule Taukobong's CRE Venture Capital. This also came on the back of a US$30 million investment by African Infrastructure Managers in Starsight Power Utility Ltd, a Nigeria-based energy services company with clients in the financial services and energy sectors. In December 2018, Nigerian Breweries Plc and CrossBoundary Energy entered into a solar PPA for the installation and operation of a 650kW rooftop solar plant at Nigerian Breweries' Ibadan brewery. On completion, the project will be the first solar-powered brewery operated in Nigeria. The solar plant is set to produce an annual supply of 1GWh of power.

There has been an increase in renewable energy funding. A syndicated-loan facility of US$10 million was set up by the Renewable Energy Performance Platform and co-financed by the Electrification Financing Initiative with the objective of making electricity available to over 150,000 people in isolated communities in Nigeria through the installation of 35,000 solar home systems over the next five years. In addition to this, the Bank of Industry (BOI) and All On announced the establishment of a 1 billion-naira Niger Delta Off-Grid Energy Fund to provide financing to off-grid energy businesses that develop energy technology in the Niger Delta. Also, at the fourth Nigeria Energy Form, held in April 2019, the European Union formally launched a €30 million fund for renewable energy projects in Nigeria.[11]

In April 2019, it was announced that Solarcentury had completed its largest project in Africa and the largest commercial and industrial (C&I) sector renewable project in Nigeria – a solar installation for Tulip Cocoa Processing Limited. The federal government through the Federal Ministry of Transportation also announced plans for solar-powered tricycles and motorcycles to introduce green transportation into the Nigerian transport system, although this plan has yet to be implemented.

III THE POLICY AND REGULATORY FRAMEWORK

i The policy background

Impact of government policy on renewable energy development

While the policy direction of the government towards the diversification of Nigeria's energy mix has been largely progressive, the administrative challenges have stifled these efforts,

11 https://www.thenef.org/.

particularly with respect to the cost of importing components and equipment required to develop renewable energy projects. With the current duty and VAT payable on solar equipment (10 per cent) and the additional 20 per cent payable on deep-cycle batteries required for energy storage, growth in the renewable energy sector currently valued at over US$50 million is significantly impeded as most of the projects are not bankable.

Support for renewable energy technological development

The government through its agencies and parastatals has put in place several initiatives aimed at supporting the indigenous development of renewable energy technology. A large part of these programmes is aimed at supporting research and development in the area of renewable energy solutions.

The Ministry of Science and Technology, through the RCET, supports research and development activities leading to the local production of solar panels, wind turbines and balancing systems (converters, inverters, controllers and chargers, etc.).

The ECN, in line with its mandate to promote the development of energy resources and renewable energy, has established a number of centres across federal institutions in Nigeria, one of which is the Sokoto Energy Research Centre, at Usmanu Danfodiyo University, Sokoto. Since its inception, the Sokoto Centre alone has been involved in over 60 pilot projects that cut across the various aspects of renewable energy technology. Other centres established in universities across Nigeria include the National Centre for Energy Research and Development, University of Nigeria, Nsukka, and the National Centre for Energy Efficiency and Conservation at the University of Lagos.

In addition to the above, the National Agency for Science and Engineering Infrastructure (NASENI), established in 1992 by the federal government, runs the 5MW Solar Panel Plant at Karshi, Abuja, for the production of solar panels and modules for Nigerians. In collaboration with the government, NASENI is pioneering the manufacture of solar plant modules and small hydropower turbines in the northern part of Nigeria; it is anticipated that these will be installed in each of the country's six geopolitical zones.

Incentives

The NREEEP provides incentives centred around renewable energy, some of which include: (1) customs duty exemptions for two years on the importation of equipment and materials used in renewable energy projects; (2) five-year tax holidays for manufacturers from date of commencement of manufacturing; (3) five-year tax holidays on dividend incomes from investments in domestic renewable energy sources; (4) provision of soft loans and special low-interest loans from the power sector development fund for renewable energy supply; and (5) grants to communities to encourage renewable energy projects.

The NERC REFIT Regulations aim at generating a minimum of 2,000MW of electricity from renewable energy by the year 2020. The power generated is accorded priority access to the grid at a guaranteed price through mandatory renewable power purchase obligations on power distribution companies (Discos) and NBET. The Regulations, however, are limited to projects with a capacity of between 1MW and 30MW, and solar projects with a capacity of 5MW and below; off-grid renewable projects do not fall within the ambit of the Regulation.

There are currently no tax credits for renewable energy as the Nigerian market has yet to develop sufficiently to accommodate initiatives of this kind; however, there are plans by the federal government, under the NREEEP, to introduce tax credits for producers of renewable energy appliances and fixtures.

Incentives for solar energy resources

The policies and incentives discussed above are largely applicable to all sources of renewable energy. However, manufacturers of solar energy-powered equipment and gadgets enjoy tax exemption (pioneer status) for an initial period of three years, which is extendable for one or two additional years.[12] This incentive is not available to other renewable energy sources.

ii The regulatory framework

Renewable energy sector regulators and key counterparties

Nigerian Electricity Reform Commission

NERC is responsible for granting all licences and approvals with respect to the entire electricity value chain (generation, distribution, transmission, trading, system operations, metering, etc.).

Transmission Company of Nigeria

The Transmission Company of Nigeria (TCN) is one of the entities created following the unbundling of the power sector. The TCN is currently the only entity licensed for transmission of electricity and consists of the market operator, the system operator and the transmission service provider. Given the TCN's monopolistic status, on-grid renewable projects require collaboration and contractual arrangements with the TCN. The market operator is also responsible for the administration of the market rules applicable to projects supplying power via the transmission network.

Nigerian Bulk Electricity Trader

Nigerian Bulk Electricity Trader (NBET) is currently the sole holder of a bulk purchase and resale licence in Nigeria. NBET enters into bulk PPAs with generation companies and independent power producers (IPPs) for the bulk purchase of power, which is then resold to the relevant Discos in Nigeria under a vesting contract.

Standards Organisation of Nigeria

The Standards Organisation of Nigeria (SON) is responsible for setting the standards of all products and equipment in or brought into Nigeria. SON through its electrical and electronics group certifies products that are imported or manufactured in Nigeria and ensures that all products and equipment are of the correct quality and standards.

Nigerian Electricity Management Services Agency

The Nigerian Electricity Management Services Agency (NEMSA) has responsibility for ensuring the enforcement of technical standards in the power sector and conducting inspections of electricity projects. NEMSA collaborates with SON and other governmental agencies to ensure that all major electrical materials are of the correct quality and standard.

12 Nigerian Investment Promotion Commission Pioneer Status Incentives August 2017.

Nigerian Customs Service

The Nigerian Customs Service (NCS) is responsible for implementing and collecting import and excise duties for products and equipment imported into Nigeria. The import duty and VAT currently imposed on the importation of solar equipment and its components is paid to the NCS.

Federal Ministry of Environment

The FMoE is the principal authority in respect of environmental matters in Nigeria. In addition to policymaking, the FMoE is in charge of EIAs for projects in Nigeria (including renewable energy projects) and issues EIA certificates for approved projects.

National Environmental Standards and Regulations Enforcement Agency

The National Environmental Standards and Regulations Enforcement Agency (NESREA) is responsible for the protection and development of the environment, biodiversity conservation and sustainable development of Nigeria's natural resources in general, and for environmental technology. NESREA is also responsible for enforcing compliance with environmental laws, guidelines, policies and standards.

Environmental concerns

Pursuant to the provisions of the EIA Act, no activity may be undertaken or authorised by the public or private sector without prior consideration, at an early stage, of its environmental effects. Where the extent, nature or location of a proposed project or activity is such that it is likely to significantly affect the environment, its environmental impact assessment shall be undertaken in accordance with the provisions of the EIA Act.[13]

Energy project developers in Nigeria have to comply with the provisions of the EIA Act. The FMoE has EIA guidelines for power sector projects, including renewable energy projects, which set out the procedure for carrying out EIAs for power projects in Nigeria.

However, under the current regulatory framework, renewable energy project proponents in Nigeria find the cost and applicable timelines for EIAs unfavourable. While recognising the obvious importance of EIAs, it would be helpful to have a simplified, affordable and efficient EIA process to speed up renewable energy project implementation, especially in respect of mini-grid projects.

Green attributes or renewable energy credits and renewable energy tracking

Nigeria's renewable energy market is still largely new and not sophisticated enough to ascribe special values to electricity from renewable energy in terms of green attributes or renewable energy credits. However, it is important to note that NREEEP proposes a power production tax credit (PPTC).

The PPTC seeks to incentivise individuals who generate electricity from renewable energy with tax credits. While this has not yet been implemented in Nigeria, it is a step in the right direction towards improving Nigeria's energy mix, as well as placing value on electricity generated from renewable energy. It is expected that the implementation of the policy and the PPTC will encourage private investment in the industry.

13 Section 2(1) and (2) of the Environmental Impact Assessment Act.

Furthermore, renewable energy power projects in Nigeria are largely off-grid, as the market has not yet developed to the point where several developers can feed power generated from renewable energy sources into the grid. While the government in recent times has shown a keen interest in ramping up renewable energy development in Nigeria, the mechanisms in place to effectively track such development across the country are minimal. The REA intends to provide data on renewable energy projects across Nigeria through its Nigerian Energy Database (NED). Although currently operational, the NED has not yet been fully developed.

Regulatory approvals and timelines

Building and construction permits are issued by the applicable state governments, and timelines for these vary from state to state. The following federal authorities issue regulatory approvals according to the stated timelines.

NERC

a Generation licence: six months from acknowledgement of the application;[14]
b mini-grid permit: 30 days from the date of receipt of a completed application;[15] and
c captive generation permit: three months from acknowledgement of the application.[16]

FMoE

EIA/EMP certificate: between six months and one year.

NEMSA

NEMSA certificate: one month.

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

i Project finance transaction structures

The privatisation of Nigeria's power sector and the acquisition of power assets worth US$3.3 billion was largely funded by local banks through corporate finance structures with guarantees required from the sponsors' existing businesses. However, Nigeria has yet to record a project financed renewable energy project. To date, the 459MW gas-fired Azura-Edo project remains the first and only successful project-financed greenfield power project in Nigeria.

Principal documentation for renewables project finance

Bankability under project finance is largely dependent on proper risk allocation as provided in the suite of agreements to be executed at each stage by the project stakeholders. A broad overview of the agreements and project documents negotiated and executed under the Azura-Edo deal, and the counterparties concerned, is provided below.

14 Section 12(b) of the Nigerian Electricity Reform Commission (NERC) Application for Licence (Generation, Transmission, System Operations, Distribution and Trading) Regulations 2010. Note, however, that in practice this may take up to 12 months.

15 Section 10(2) of the NERC Mini-Grid Regulation.

16 Section 7(b) of the NERC (Permits for Captive Power Generation) Regulations 2008.

Property and land documents

Under the Azura-Edo project, the following property documents were executed between the Edo state government and Azura Power in conjunction with the relevant host communities: Certificate of Occupancy (C of O), Deed of Assignment or Deed of Lease.

Power purchase agreement

A PPA was concluded between NBET and the Azura-Edo IPP.

Finance documents

Some of the finance documents executed under the Azura-Edo project include: security documents such as an account charge agreement; intercreditor agreements; hedging agreements; subordination agreement; accounts agreements; DFI loan agreements; local bank loan agreements; common terms agreement; claims cooperation agreement; and mezzanine loan agreement.

Credit enhancement facilities

A standby letter of credit (LC) was provided by NBET backed by a series of World Bank PRGs provided by the International Bank for Reconstruction and Development (IBRD).

IBRD also provided political risk insurance cover, which was also contemplated under the insurance cover provided by the Multilateral Investment Guarantee Agency (MIGA).

Other credit documents and agreements executed under the Azura-Edo deal include:

a project agreement (debt mobilisation) between IBRD and the Azura-Edo IPP;
b PRG (debt mobilisation) between IBRD and the lender's agent (Standard Chartered);
c indemnity agreement between IBRD and the federal government;
d project agreement (letter of credit) between IBRD and Azura-Edo;
e reimbursement and credit agreement between JP Morgan (LC issuing bank) and NBET;
f MIGA host country approval between the federal government and MIGA; and
g NBET cooperation agreement between IBRD and NBET.

Operations and maintenance agreement

An operations and maintenance (O&M) agreement was concluded with the O&M contractor.

Engineering, procurement and construction contract

An engineering, procurement and construction (EPC) agreement was concluded with the EPC contractor.

Original Equipment Manufacturer Agreement

An original equipment manufacturer (OEM) agreement was concluded with the manufacturer.

Put–call option agreement

The PCOA sets out the terms and conditions by which the investor may sell its interest or shares in the project company to the federal government in the event of a government or investor default under the PPA with NBET. In the Azura-Edo deal, the PCOA was entered into between the federal government, NBET and the Azura-Edo IPP.

Direct agreements

Direct agreements give the lenders the right to step into the shoes of the sponsors where there has been a default. It allows the lenders an opportunity to cure any defect that might occur as a result of an action or inaction of the project sponsors. This will typically include: a PPA direct agreement; an O&M direct agreement; an EPC direct agreement; and a PCOA direct agreement.

Tenor of renewable energy projects

There is currently no industry standard for the term of a debt for renewable energy projects in Nigeria, particularly as there is no recorded project-financed renewable energy project. Commercial bank loans are typically short-term loans of three to seven years, except in the case where credit enhancements have been provided to give comfort to the banks, as was the case in the Azura-Edo deal. The Azura-Edo deal was financed with loans from a range of DFIs, local banks and multilateral agencies. In contrast to commercial bank loans, DFIs typically provide long-term financing for a period of 15 to 20 years.

Principal participants in project finance transactions

Within the Nigerian context and using the Azura-Edo project as a benchmark, the participants in a traditional project finance structure will include the following:

a the project sponsor, who typically would be the initial promoter of the project and could be an individual, a company, a state or a combination of these;

b co-sponsors, who will typically include bigger project development companies with deeper pockets, more technical experience and access to financing who would join the project at certain stages of the project (depending on their risk appetite); for example, the Azura-Edo project had a total of five sponsors;

c the lenders, who, in a syndicated lending, would include lead arranger, security trustee and facility agent;

d DFIs and export credit agencies;

e guarantors (e.g., MIGA, World Bank);

f advisers, including technical advisers, legal advisers, financial advisers, tax and audit and environmental impact advisers;

g the state or federal government, as applicable;

h the TCN;

i contractors (EPC, OEM and O&M);

j offtakers (NBET in this instance); and

k insurance companies.

Institutions involved in the financing and offtake of renewable energy projects

Financiers

Commercial banks

The commercial banks involved in the Azura-Edo project include Standard Chartered Bank, Siemens Bank, Stanbic IBTC Bank, Rand Merchant Bank and First City Monument Bank. However, we have noted that the commercial banks are hesitant about funding renewable energy projects and we have yet to see any funding structure involving a commercial bank for such projects. We are also aware that some projects may utilise Islamic finance models in their financing structure.

DFIs

The DFIs used in the financing of the Azura-Edo project include Africa Finance Corporation, FMO, Infrastructure Crisis Facility – Debt Pool, and CDC Group. It is important to note that the IFC and FMO are currently involved with a few of the 14 solar project developers.

Offtakers

Several institutions purchase and use renewable energy, mostly as an alternative source of power. For the supply of power on-grid, the offtaker is NBET. As Nigeria's renewable energy market has yet to be fully developed to accommodate the injection of power from distributed renewable energy sources, most projects that adopt renewable energy operate hybrid systems with power from renewable energy sources serving as backup to grid or diesel generators. This is typically the case with respect to commercial banks that use solar to power ATMs, or petrol stations that use solar to power their dispensers. Furthermore, residential offtakers, as well as businesses and SMEs in the service industries, including small health solution centres, tailors and salons, make up a high percentage of the offtakers that utilise solar energy in Nigeria. In Nigeria, unlike in other countries, there is no market for renewable energy credits.

Distributed and residential renewable energy

Distributed renewable energy generation is the most common method of renewable energy deployment in Nigeria, with solar energy being the most prevalent source of renewable energy utilised. The distributed renewable energy providers in Nigeria offer various options for power supply, which entail different ownership structures:

a Outright purchase: energy consumers may acquire the solar energy equipment by outright purchase and install it on their sites for their use. In this case, the electricity consumer takes full ownership of the equipment.

b Lease to own: renewable energy providers also offer lease-to-own schemes that allow the electricity consumer to pay for the equipment over a period while continuing to use it. Ownership remains with the renewable energy provider until payment is complete and it then passes to the electricity consumer.

c Subscription (power as a service): in this arrangement, the solar equipment is installed on the electricity consumer's site; however, there is no transfer of ownership. Instead, the consumer merely pays a subscription fee to use the equipment. Ownership remains with the energy provider.

The current trend in the Nigerian market is for small-scale solar systems that can be used to either supplement grid power or generators. Companies such as Arnergy Solar and MTN Lumos are prominent players in this space. New entrants to the market such as Rensource, who provide subscription-based power from solar, are expected to help grow Nigeria's renewable energy market by providing highly competitive prices and flexible power solutions that can be tailor-made to meet the needs of both businesses and residential offtakers.

Non-project finance development

Apart from project financing models, other non-project finance structures have been explored for developing renewable energy projects globally. One such structure is crowdfunding, which has helped support a number of projects in Africa, some of which are in Nigeria. While crowdfunding is currently not permitted in Nigeria, developers have been able to

take advantage of foreign crowdfunding platforms to finance local projects. A good example of these platforms is Bettervest GBMH, a German company that has publicly expressed interest in the financing of renewable energy projects. Through Bettervest, SOSAI Renewable Energies Company, an indigenous company, has been able to raise almost €450,000 in three investment rounds from over 800 investors around the world. Also, Havenhill Synergy Limited, in addition to its US$50,000 grant from the USADF, is seeking to raise additional funding using Bettervest for up to 69million naira to undertake a solar mini-grid project in Kwaku, Abuja.

Investment funds have in recent times been explored to finance renewable projects in Nigeria. CrossBoundary Energy, Africa's first dedicated fund for commercial and industrial solar, falls within this category. Renewable energy developers have also benefited from grants provided by DFIs in Nigeria, such as the Bank of Industry, and international DFIs such as the UK DFID and the African Development Bank, which recently approved a US$25 million investment fund for renewable energy projects in Nigeria and West Africa.

Furthermore, the federal government has taken to providing financing for renewable energy projects in Nigeria; for example, the 10 billion-naira green bond issued by the federal government aimed at supporting the Energising Education Programme (a federal government initiative to provide a sustainable and clean power supply to 37 federal universities and seven university teaching hospitals across Nigeria) implemented by the REA, as well as funding of seven solar hybrid projects.

V RENEWABLE ENERGY MANUFACTURING

While the government has established a number of manufacturing facilities, most local companies are primarily involved in the assembly of renewable energy equipment, particularly solar panels and other solar energy components and systems. Although NASENI claims to have produced solar panels in its Karshi plant, it is unclear whether these have been made available for commercial consumption. However, given the announcement in April 2019 by the Borno State government of the completion of Africa's largest solar panel factory, Nigeria may benefit from a huge boost in renewable energy manufacturing. The fully automated factory is expected to produce 40MW worth of solar panels annually, with each panel possessing the capacity to generate 300W of power. However, through the combined efforts of the RCET under the Ministry of Science and Technology, the ECN through the various research centres spread across the country, and entities such as NASENI, Nigeria is considered to be poised to commence indigenous manufacturing in the very near future.

In addition, the federal government, in a bid to encourage local manufacturing and participation within the renewable energy space, introduced several incentives in the NREEEP. The incentives include but are not limited to:

a individuals engaged in the manufacturing of batteries and accumulators are granted a five-year tax holiday, renewable for a period of two years and;

b individuals engaged in the manufacturing of transformers, meters, control panels and other electricity-related equipment are granted a five-year tax holiday, renewable for a period of two years.

While these incentives are aimed at encouraging manufacturing of renewable energy equipment, there are no tariffs with respect to renewable energy equipment.

VI CONCLUSIONS AND OUTLOOK

There are currently up to 14.2 million households and four million SMEs without access to electricity, which translates as 33 per cent of the population being off-grid. Of the 67 per cent connected to the grid, 43 per cent to 45 per cent receive electricity for less than four hours a day, which means that there is great reliance on self-generation using generators. With the United Nations projecting Nigeria's population to exceed 300 million by 2050, thereby overtaking the United States as the third most populous nation in the world, it is crucial that the current supply outlook is addressed urgently, to match the growing population and its electricity needs.

The federal government, under the NREEEP, plans to ramp up the percentage contribution of solar energy to the energy mix to a minimum of 3 per cent by 2020 and 6 per cent by 2030. Furthermore, once commercial issues are resolved, the prospect of 14 solar PPAs becoming operational, combined with the innovative efforts of the REA to harness renewable power through its special EEI and EEP projects, suggests that Nigeria's renewable energy future is looking bright.

In addition to the above, the rapid growth of stand-alone solar solutions in recent years is also a testament to the opportunities that lie in the energy sector, with more solar companies focusing on providing small-scale solutions to meet everyday household and commercial needs. This is further complemented by the investments in the mini-grid space under the NESP, NEP and NPSP platforms, However, it remains important to address the challenges in financing on-grid, off-grid and distributed energy projects in Nigeria, to make attracting investment in such projects more viable. C&I consumers are increasingly interested in affordable and reliable power solutions, and the use of solar power systems is a growing trend because of the heavy costs of diesel generators and the environmental ambitions of these companies.

To move Nigeria's renewable energy sector forward, the government will have to focus on ensuring that the relevant policies to encourage development of renewable energy projects (including manufacturing components locally) are codified and duly enforced by the various regulators and stakeholders. Also, the government must address both the administrative bottlenecks (which often cause delays and stifle investment) and the liquidity issues in the sector by harmonising processes, technical codes and standards to enable capacity development in the sector.

Chapter 13

RUSSIA

Thomas Heidemann and Dmitry Bogdanov[1]

I INTRODUCTION

After years of being considered an 'oil-and-gas country', Russia now has an expanding renewable energy sector following a recent spate of foreign investment, and the installation and construction of several renewable energy projects.

The Soviet Union had a track record of developing renewable energy projects, especially large hydropower projects but also wind energy projects. Nevertheless, from 1970, low oil prices led to the complete abandonment of this sector, which was then neglected by Russian politics.

This situation changed only with the adoption of a national strategy for the development of renewable energy in 2009, which became necessary after Russia joined the Paris Climate Agreement and had to meet the obligations in the Agreement to reduce its carbon dioxide emissions.

As regulatory incentives were poor, the sector only started to develop after a serious shift in stimulation measures for the production of renewable energy in 2013 through the introduction of a capacity-based stimulation system.

II THE YEAR IN REVIEW

As in 2017, 2018 also saw relatively large renewable energy capacity auctions and assignments under the new regulations of Decree 449 dated 28 May 2013 on the Mechanism for the Promotion of Renewable Energy on the Wholesale Electricity and Capacity Market (Decree 449).

For example, as a result of tenders carried out in 2018 in the wind power industry, wind farms with an aggregate capacity of more than 850MW will be constructed in Russia in the coming years. Eight regions of Russia will be involved in the implementation of these projects.

AO VetroOGK, a structure controlled by the State Atomic Energy Corporation (Rosatom), was awarded two projects with an aggregate capacity of approximately 30MW. The wind power plants will be constructed between 2019 and 2021 in Krasnodar Krai. The company is also currently implementing projects awarded previously, and has stated that its total investments in wind projects in Russia may exceed US$1,300 million. The technology for the projects will be provided by Dutch manufacturer Lagerwey.

OOO Fortum Energy, a joint venture between Fortum and Rusnano, won tenders for the construction of wind farms with an aggregate capacity of more than 820MW. The

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power generation facilities will be put into operation between 2019 and 2023. The two companies have announced their intention to invest approximately €400 million in wind farm construction projects, which will be sited in Rostov, Perm, Krasnodar Krai and other Russian regions. Danish giant Vestas, one of the world's largest producers of wind turbines, will supply the turbines and components for the projects.

PAO Enel Russia, the key Russian company in the Enel Group, did not participate in the 2018 tender. Apparently the company will concentrate on further implementation of projects it was awarded previously, with total investments in the projects estimated at approximately €405 million. It has been announced that one of the technological partners in the projects will be Siemens Gameza, a joint venture between German company Siemens and the Spanish Gameza.

These projects show that legislative changes have succeeded in increasing the sector's attractiveness for investors.

The 2019 auctions are currently under way and are also expected to be successful. However, the renewable energy capacity to be tendered in 2019 is significantly lower than in 2017 and 2018, namely 78.1MW for the wind power industry, 5.6MW for solar (photovoltaic) energy and almost 230MW for medium-sized hydro sources.[2] The reason for this overall reduction is that approximately 90 per cent of the power generation capacity targeted until 2024 by the state policy on energy-efficiency improvement (see Section III) has been already assigned.

It appears that a standard structure for renewable energy projects has emerged from recent and current auctions, consisting of the creation of joint structures in which Russian state entities team up with foreign strategic investors in the renewable energy sector. The new regulations, combined with localisation requirements stipulated by law, have also initiated the creation of local high-technology production facilities in Russia.

III POLICY AND REGULATORY FRAMEWORK

i The policy background

In January 2009, the government approved the state policy on energy efficiency improvement (the Policy).[3] When adopted, the Policy covered the period until 2020 and provided key directions for the development of renewable energy projects in Russia. Later, the Policy was significantly amended. Through these amendments, the government set out the current legal framework based on the state-supported capacity supply system, and extended the effect of the Policy to cover the period until 2024.

In November 2009, the government approved the Russian energy strategy for the period until 2030 (the Strategy).[4] The Strategy aimed to announce a number of measures to ensure the efficient use of natural energy resources, and to set out key principles of government support to various energy sectors. In particular, the government announced certain efforts to create an environment that allows the development of renewable energy sources and their increased share in the Russian energy sector.

Through these two documents, the government laid a foundation for the further development of the renewable energy sector in Russia, determined its main directions and

2 A medium-sized hydropower plant is one whose aggregate capacity is between 5MW and 25MW.

3 Decree of the Russian Government No. 1-r dated 8 January 2009.

4 Decree of the Russian Government No. 1715-r dated 13 November 2009.

created a legal framework for further projects. Both documents became a legislative basis for the adoption of more specific regulations, which created the current legal regime for all activities within the sector.

The Policy, as a key source of basic principles, provided the main targets to be reached in the sector. The initial version of the Policy specified that renewable energy in the Russian energy sector should have reached 2.5 per cent by 2020. Amendments introduced in 2015 changed this target: according to the current version of the Policy, Russia aims to meet a 4.5 per cent share of its energy requirements with renewable energy by 2024. The Ministry of Energy was empowered to allocate the targeted capacity between various renewable energy sources, initially wind, solar (photovoltaic) and medium-sized hydro sources. As from 2017, it also included waste-to-energy renewable energy facilities. This was a new direction for the development of renewable energy projects in Russia and the government determined[5] that these waste-burning plants would first be constructed in the regions of Moscow (approximately 280MW) and the Republic of Tatarstan (55MW). In 2018, two new Russian regions were added: Krasnodar Krai (55MW) and Stavropol Krai (55MW).[6] However, no bids were submitted for these new projects and the 2018 tender for construction of waste-burning plants was not successful.

Russia's energy policy emphasises the importance of local production development in the renewable energy sector. Russia has been trying since 2012 to replace imports, particularly of technologically complex products, with locally produced products. The government encourages potential investors to run production of high-tech components for power-generating facilities in Russia to develop competitive local technologies and production in the country (see Section V for a more detailed description of localisation rules).

ii The regulatory framework

Legal framework and existing regulations

Russian lawmakers began focusing on renewable energy as early as 2007 with the passage of an amendment to the Law on Electricity[7] that attempted to connect renewable energy sources into Russia's electricity generation system. Despite this attempt, a renewable energy programme was not successfully implemented until 2011, when further changes to the Law on Electricity created an incentive scheme for investment in this sector. These changes led to the passage of Decree 449 two years later and the renewable energy developments Russia is seeing today. The basis for the current expansion of Russian renewable energy was the passage in 2013 of Decree 449.

Initially, the government proposed to incentivise renewable energy market participants through premium payments. In 2007, amendments to the Law on Electricity introduced a 'premium scheme' as the principal promotion mechanism. This scheme envisaged that a certain premium on the equilibrium energy price in the wholesale electricity and capacity market would be paid to suppliers in renewable energy projects. However, this mechanism did not work in practice because of certain legal and technical issues, and because of the potential impact on prices for end customers.

5 Decree of the Russian Government No. 355-r dated 28 February 2017.

6 Decree of the Russian Government No. 567-r dated 31 March 2018.

7 Federal Law on Electricity No. 35-FZ dated 26 March 2003.

Subsequently, in 2013, the premium scheme was replaced by the 'capacity supply scheme' and the government adopted one of the key regulations establishing the existing state support mechanism for Russian renewable energy projects – Decree 449.

The key idea of the capacity supply scheme consists in switching from a 'premium' component to a consideration payable to the provider of power generation capacity. The consideration is calculated on the basis of the beneficial fixed tariff.

Applying beneficial tariffs fixed for 15 years allows market players to receive a guaranteed return on an investment made in the construction and operation of a power facility. The tariffs take into account the capital expenditure amount, currency fluctuations and other factors, and provide a 12 to 14 per cent profit margin.[8] We describe the structure of the beneficial tariffs in more detail below. However, to apply such a tariff, suppliers have to comply with the Russian localisation requirements.

Decree 449 deals with solar, wind, medium-sized hydro and waste-burning power sources, and thus does not cover the entire field of renewable energy sources. Renewable capacities supplied must be equal to or exceed 5MW. Decree 449 is also restricted to the central tariff zone, and does not apply to 'non-tariff zones' and isolated territories.

The main mechanism under Decree 449 for encouraging the use of renewable energy is the conclusion of long-term energy capacity supply agreements with renewable energy source operators. A potential supplier is granted the right to enter into such agreements through a tender procedure conducted by the Trading System Administrator (ATS). Under such an agreement, a supplier will be obliged to create the renewable energy facility within a certain time frame and to supply capacity into the Russian energy system. The supplier will be entitled to receive remuneration for its capacity and for the energy it supplies based on 15-year fixed prices.

In particular, the procedure for concluding an agreement on capacity supply includes the following stages. Capacities are offered to potential suppliers once a year in a tender process organised by ATS. Potential suppliers are invited to submit their bids according to the conditions provided for in Decree 449. Together with a technical description of the project, the bid shall specify the degree of localisation of the renewable energy facility as well as financial guarantees for the potential supplier's obligations. After bids are submitted, ATS will select the tender winners and conclude agreements on energy capacity supply with them.

A potential supplier's main obligation under the agreement is to create a renewable energy facility within the agreed parameters for capacity, localisation levels and timings. Agreements will always contain provisions on substantial penalties for delays in capacity supply.

Another central element of any agreement will be the localisation requirements. Decree 449 requires establishing detailed lists of localisation percentages for the different elements of renewable energy facilities. In addition, reaching the agreed level of localisation plays an essential role in determining the price for the supplied capacity. If this level is not reached, the price will be significantly lower (35 per cent lower for solar power sources, and 45 per cent for wind, medium-sized hydro and waste-burning power sources), which will render the relevant projects economically disadvantageous.

After completing construction of a renewable energy facility, the supplier must apply for recognition of this source as a qualifying generating facility to be able to supply capacity

8 Currently an investor may expect a 12 per cent profit margin; a 14 per cent margin was provided to renewable energy projects whose tenders were carried out in 2013 and 2014.

to the market. The qualification process involves both federal authorities (the Ministry of Industry and Trade of the Russian Federation) and the wholesale market organisation (the Market Council).

When the supplier applies to the Ministry of Industry and Trade for determination of a renewable energy facility's degree of localisation, the Ministry will assign this determination to a special commission. Based on the commission's resolution, the Ministry will submit a statement to the Market Council, which will in turn allocate the renewable energy facility to one of three categories of localisation level: less than 50 per cent, between 50 and 70 per cent, or above 70 per cent. The corresponding price will be based on the Market Council's qualification.

Institutional framework, and the regulators and their respective powers

The Russian electricity market is a two-level (wholesale and retail) electricity and capacity market. The retail market involves an end-consumer element, while the wholesale market mostly consists of generation companies, retail companies and large consumers.

The wholesale market commodities are electricity and capacity. Acquisition of capacity by an acquirer means that it has a right to demand from the supplier that electricity of a defined quality be generated by his or her generating equipment. Thus, the sale of capacity is in fact an arrangement for the provision of certain volumes of electric power in the future.

Provision of capacity generated through renewable energy sources is one of the mechanisms used in the wholesale capacity market. As already mentioned above, this mechanism is structured through the capacity supply agreements entered into as a result of the tenders for the selection of investment projects in the respective areas.

The tenders are conducted four years in advance for each different type of generating facility, depending on the applicable type of renewable energy source: solar (photovoltaic), wind and water (medium-sized hydro) energy. Since 2017, a similar procedure has applied to waste-burning energy facilities.

A first step for potential participants entering the market would be conformity with the Rules of Wholesale Electricity and Capacity Market Operation established by Decree No. 1172.[9] Participants are required to enter into a wholesale electricity and capacity market accession contract and acquire membership of non-profit partnership association the Market Council. A mandatory form of accession contract is approved by law, and cannot be renegotiated or amended by market participants. Once the accession contract is entered into, the market participant is deemed to be involved in the wholesale capacity market.

The following key entities regulate commercial activities within the market:

a a general regulator: a non-profit partnership association, the Market Council;
b a commercial operator of the wholesale market: ATS (as mentioned above); and
c a settlement operator: the JSC Centre of Financial Settlements (CFS).

The Market Council:

a maintains the register of wholesale market participants;
b prepares wholesale market regulations and the standard form wholesale market contracts (including amendments to them);

9 Decree of the Russian Government No. 1172 dated 27 December 2010 on Approval of the Rules of Wholesale Electricity and Capacity Market Operation.

c provides certain supporting services to market participants; and
d acts as a compliance controlling body and pre-court arbitrator in certain cases.

The Market Council also exercises authority in relation to certain aspects of the use of renewable energy facilities.

ATS is primarily responsible for conducting state tenders and entering into contracts with wholesale market participants.

CFS provides settlement services to all market participants and ensures the effective operation of the complex settlement system in the wholesale capacity market.

The activities of all three entities are regulated and controlled by the government.

Typical project steps, regulatory approvals and time frames

Based on what has been discussed above, the typical project steps for potential market participants would be as follows:

a entering into an accession contract and acquiring membership of the Market Council. A Russian legal entity will be required to be established for this purpose;
b participating in a tender. The tender procedure, with its specific formal requirements, will certainly be a challenge. Among others, the drafting of a precise bid corresponding to the technical requirements is one of the major tasks;
c in the event of winning the tender, a market participant will automatically become a party to the capacity supply agreement entered into with each of the buyers acting on the wholesale capacity market (currently 240 plus buyers). The form of the agreement is approved by law and cannot be renegotiated by the winner. If the form is amended by the government (which usually occurs several times a year), the amended agreement becomes automatically binding on all market participants;
d building a power generating facility with the technical and production characteristics described in the tender bid and capacity supply agreement;
e going through the qualification procedure and receiving a qualification certificate in respect of the power generating facility from the Ministry of Industry and Trade; and
f putting the power generating facility into operation by the date specified in the applicable capacity supply agreement.

Particular time frames for projects are determined by the deadline indicated in the respective capacity supply agreements. In practice, the deadline is usually from one-and-a-half to four years from the date of the tender. If the deadline is missed, significant penalties will apply to the supplier. These penalties will automatically be discharged from the supplier's account, which is opened in the settlement system by CFS. Subject to the provision by the supplier of additional financial security, the deadline can be postponed, but for not more than two years overall.

Recent renewable energy project developments

As can be seen from the above, in the Russian wholesale capacity market there is none of the project development typically seen in international energy markets, as the Russian market's activities are strictly regulated by law.

However, potential capacity suppliers do not enter into project tenders alone. The companies combine their efforts and create consortiums involving global Russian

participants, foreign investors, and local participants responsible for issues that may arise on Russian territory. These structures allow the creation of strong teams that can effectively resolve issues that arise.

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

i Project finance transaction structures

Projects are usually financed by foreign investors at the outset. However, as Russian market participants are large reliable companies, they also participate in the financing of projects.

After a tender, the initial investors make efforts to attract borrowed financing, typically using standard project financing such as bank credit facilities; for example, it was announced that Gazprombank would finance the construction of wind farms by Rosatom, with investment of approximately 64 billion roubles.[10]

As mentioned above, pursuant to Decree 449, the main mechanism guaranteeing investors a return on their investment (thus allowing them to repay the borrowed financing) is the application of beneficial tariffs, fixed for 15 years under the relevant energy capacity supply agreements.

In addition to the incentives provided by Decree 449, suppliers are also entitled to apply for subsidies from the Russian federal budget, provided that they meet certain criteria. These subsidies could include reimbursement of costs for the technological connection of the generating facility to the electrical power networks.

New incentives are currently being sought for more competition on the market, in particular by increasing the sales of electricity (capacity) produced using renewable energy sources.

ii Distributed and residential renewable energy

Distributed (on-site) and residential renewable energy is not widespread in Russia and thus it does not play any significant role in the national economy.

Traditional energy sources such as oil, gas and coal are commonly used to supply power to isolated territories. However, relatively small generating companies, using renewable energy sources, are now emerging in these territories.

iii Non-project finance development

Although the share of project financing in renewable energy projects in Russia is now increasing, most projects are currently implemented through structures or joint ventures established or controlled by state-owned corporations such as Rosatom and Rusnano (see Section II). These corporations can be considered equity investors in their respective projects.

Some relatively minor investors prefer to use their own funds or to attract financing from their parent companies.

10 https://dront.ru/news/2017/03/28/gazprombank-profinansiruet-stroitelstvo-vetryanyh-elektrostantsij/.

V RENEWABLE ENERGY MANUFACTURING

i Participation in a tender and localisation requirements

Russian industrial policy has been trying since 2012 to replace imported materials with locally manufactured ones. This policy is generally described by such terms as 'import substitution' and 'localisation'. Since the Law on Russian Industrial Policy No. 488-FZ[11] took effect in June 2015, the public procurement rules for many types of goods have changed, and a new rule requiring these goods to be made locally in Russia was established.

Russia has chosen a similar path for developing its renewable energy sources: both the distribution of capacity and the level of prices for the supplied capacity depend on the degree of the localisation of the power generating facility, namely:

a within the tender procedure for selecting investment projects involving the construction of power generating facilities using renewable energy sources (tender), the future operator undertakes to generate power using a generating facility whose construction meets a certain percentage of localisation. This obligation is one of the most important preconditions for winning a tender; and

b the power generating facility is subject to certification once its construction is completed. During the certification, the competent authorities verify, inter alia, the facility's compliance with the localisation obligations.

To be admitted to a tender, operators have to register as wholesale market participants. The minimum amount of supplied capacity by operators who are wholesale market participants is 5MW. Specifically, for operators of hydro energy plants, there is an additional maximum limit of 25MW. The volume of supplied capacity is estimated by each operator before the actual construction of the power generating facility by signing contracts on the design and construction of the corresponding facilities. The estimates are also set out in the capacity supply agreements that are signed with tender winners. A failure to honour these agreements will trigger contractual penalties.

Furthermore, when planning to participate in a tender, operators have to consider the requirements in terms of the maximum amount of capital expenditures for the construction of the power generating facility, which is one of the tender's criteria. This amount depends on the renewable energy resource and the year of participation in the tender. For example, the capital expenditures for the construction of solar plants for projects that are selected in 2018 may not exceed, inter alia, 105,262 roubles per KW in 2019 and 103,157 roubles per KW in 2020. For wind plants, the upper limit is, inter alia, 109,561 roubles per KW in 2019 and 109,451 roubles per KW in 2020. Finally, the upper limit for medium-sized hydro energy plants is 146,000 roubles per KW from 2019 to 2023. Therefore, companies participating in tenders only compete on the basis of the amount of capital expenditure required to develop the facility.

As mentioned above, a certain degree of localisation must be reached to win a tender. Power generating facilities and their components and equipment have to be at least partly manufactured in Russia. Since 2016, 70 per cent of the generating equipment for solar energy plants has to be made in Russia. Wind energy plants have to attain a 65 per cent localisation level from 2019. For medium-sized hydro energy plants, the localisation degree

11 Federal Law on Industrial Policy in the Russian Federation No. 448-FZ dated 31 December 2014.

is also 65 per cent. Government Decree No. 426[12] defines the components and operations that are used for calculating the degree of localisation and its rate. Non-compliance with these requirements means that an operator can no longer participate in a tender. The declared localisation degree is also based on operators' forecasts, the planned local industrial capacity and their contracts with the suppliers or manufacturers of components and equipment. The localisation requirements are rather high and, at the same time, most components and equipment for power generating facilities are still not manufactured in Russia. Tender winners are therefore usually confronted with the need to produce the components and equipment themselves shortly after concluding a capacity supply agreement. If a tender winner fails to comply with the agreed timelines and the stipulated localisation degree, it may be subject to contractual penalties ranging from 85 to 100 per cent of the contract's total value.

After the construction of a plant, its certification as a power generating facility that uses renewable energy sources is the final step to set the price for capacity. For the purpose of this certification, the operator first has to file an application for the determination of the degree of localisation with the Ministry of Industry and Trade. After receiving this application, the Ministry passes the application on to the Commission overseeing determination of the degree of localisation of the power generating facilities using renewable energy sources. After reviewing the submitted documents, the Commission then makes a decision that is used by the Ministry to determine the localisation degree and to send a copy of its decision to the Market Council. Finally, the Market Council classifies the power generating facility into one of three categories, depending on the degree of localisation: less than 50 per cent, between 50 and 70 per cent, and above 70 per cent. The price for the supplied capacity will be determined specifically on the basis of its allocated category.

When establishing whether a certain component is produced in Russia, the general rules for determining the country of origin of goods (as provided for by the customs legislation) will apply, unless a component is produced within the special investment contract (SPIC) framework. This exception to the general rule is expressly provided for by law.

ii SPICs

Signing a SPIC has proved to be one of the decisive conditions for meeting the localisation requirements, since it enables any operator who has entered into a SPIC to treat imported components as if they had been produced locally in Russia for the purpose of calculating the localisation degree at the initial stages of the implementation of an investment project.

SPICs were first introduced in the Law on Russian Industrial Policy No. 488-FZ.[13] Thanks to Government Decree 708,[14] which contains, inter alia, a model for SPICs, SPICs eventually became applicable in practice. SPICs can be entered into either at the federal level or with the participation of regional and local authorities.

The investor's main obligation under the SPIC framework is typically to establish or modernise the production of specific goods, including those that were hitherto not produced in Russia, with certain minimum volumes of investment and production in accordance with the agreed business and production plans, which are to be incorporated into the SPIC.

12 Decree of the Russian Government No. 426 dated 3 June 2008 on Certification of Generating Facilities Functioning as Renewable Energy Sources.

13 Federal Law on Industrial Policy in the Russian Federation No. 448-FZ dated 31 December 2014.

14 Decree of the Russian Government No. 708 dated 16 July 2015 on Special Investment Contracts for Certain Industrial Sectors.

The competent authorities control the due fulfilment of the investor's obligations under the SPIC. In turn, the investor is granted certain incentives, usually in the form of tax reliefs and preferences in public procurement, as well as a special regime for determining the localisation degree. The scope of incentives available under a SPIC is limited to those provided by law. SPICs are entered into for a period that is equal to the time frame required to make the project operationally profitable according to the business plan plus five years, but in any case, this should not be more than 10 years.

New rules for entering into SPICs (SPIC 1.1) were adopted by Decree,[15] with effect from 18 June 2018. In particular, these new rules provide that entities registered in offshore zones cannot be SPIC participants.

Currently, there are two competing drafts (SPIC 2.0 and SZPK) of federal laws aiming to regulate the conclusion of agreements affording support to investments in the Russian Federation, including in the renewable energy sector. Unlike SPIC 1.1, under SPIC 2.0 a SPIC has to be entered into through a tender process. The second draft bill introduces a new type of agreement, the SZPK, for the promotion and protection of investments. Unlike SPICs, SZPKs provide for a less formal contractual process, simply requiring the filing of a declaration on the implementation of the investment project.

Since neither bill has been adopted yet, it is difficult to forecast which concept will ultimately be chosen. It is therefore likely that the current regime, SPIC 1.1, will remain in place for some time.

VI CONCLUSIONS AND OUTLOOK

Implementing incentive mechanisms for the use of renewable energy in the Russian legal system has created significant activity in this sector, and renewable energy facilities are constantly under construction. Localisation requirements have brought new production facilities to the country, with suppliers able to produce components for renewable energy locally now being in high demand.

We expect the market to further develop and to encompass segments that are currently beyond the scope of Decree 449, such as energy supply sectors in isolated territories. Russian politics are supporting these developments. Today, Russian renewable energy offers more potential and opportunities than ever before.

It should be noted that according to a statement of the Market Council, and as mentioned above, as at the beginning of 2019, approximately 90 per cent of the targeted capacity has already been awarded to various market participants. The awarded capacity was mostly allocated among wind and solar energy projects. The market is still awaiting new regulations regarding the period beyond 2024. At present, there is uncertainty regarding future support for the renewable energy sector after the expiry of the current incentives.

Large industrial consumers have objected to the extension of the Policy, calling instead for the adoption of alternative measures to support the renewable energy sector. The main reasons for their dissatisfaction are the price of power capacity and the increase in the costs of implementing renewable energy projects. However, the key investors in the Russian

15 Decree of the Russian Government No. 1564 dated 16 December 2017 on Amendments to Certain Acts of the Russian Government Relating to a special Investment Contract.

renewable energy sector (such as Rusnano) have requested the extension of the Policy until 2035. They believe the Russian renewable energy sector is still too young to function under the general competitive rules of the Russian energy market applicable in other sectors.

While the outcome of the dispute about the extension of the Policy remains unclear, the Market Council has initiated development of the concept of Russian green certificates, which may be used to supplement the existing structure. Work is being done by the Market Council in this respect; thus, for the first time in Russia, the concept of green certificates seems to be a potentially workable option. By selling these green certificates, consumers could reduce their total amount of payments for capacity under the current support mechanism of capacity supply agreements, while for power suppliers, the green certificates could act as a source of return on their investments.

Consequently, the Russian renewable energy market is now awaiting further changes to the legal regime, and these changes will certainly provide a new impulse for further development in the industry.

Chapter 14

SOUTH AFRICA

Lido Fontana and Sharon Wing[1]

I INTRODUCTION

The fundamental driver for renewable energy projects in South Africa remains the Renewable Energy Independent Power Production Procurement Programme (REIPPPP) of the Department of Energy (DoE). Prior to the formal launch of REIPPPP in August 2011, the local renewable energy market was fairly inconsequential. A lot has changed since then, with REIPPPP being heralded globally as a shining example of how to successfully implement renewable energy auction programmes. The success achieved by REIPPPP has, however, not been without its challenges. Eskom Holdings SOC Limited (Eskom), the state-owned national utility and sole offtaker of electricity from projects under REIPPPP, historically refused to sign any further power purchase agreements (PPAs) with independent power producers. However, Eskom's monopolistic stronghold over the energy sector loosened during 2018, when Eskom signed 27 independent renewable energy agreements with a combined investment value of 56 billion rand and capacity of 2,300MW from bid windows 3.5 and 4 of REIPPPP.

Eskom's historical monopoly on generation in South Africa has been gradually challenged by independent power producers that are able to deliver generating assets largely on time and on budget – key features that have been somewhat lacking in Eskom's skill set for some time, leading to above-inflation increased costs of electricity to the end users (while the tariff prices under REIPPPP continue to drop dramatically in each procurement round). Eskom is in a financial 'death spiral', owing over 400 billion rand to its creditors. In addition, by the end of 2018, South Africans were hard hit by rolling blackouts that were implemented to protect the grid from total collapse or blackout. The lack of energy capacity is due to Eskom's poor management; lack of funding or misappropriation of funds; and maintenance and labour issues. Further, the expensive and overdue operation of Medupi and Kusile coal-fired plants have resulted in the grid operating on the edge and the government of South Africa being forced to consider the unbundling of Eskom. This will result in Eskom being unbundled in three divisions, namely generation, transmission and distribution, which will positively kill Eskom's monopoly, but millions of taxpayers will face the cost of implementing this. Eskom's credit rating has also hit rock bottom, with a Standard & Poor's credit rating below sub-investment grade.

The unbundling of Eskom may make it easier for renewable energy plants to supply electricity to the national grid and the draft Integrated Resource Plan (IRP), which was released for public comment during August 2018, provides that the energy mix by 2030

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will consist of coal (46 per cent), 1,860MW of nuclear (2 per cent), 4,696MW of hydro (6 per cent), 2,912MW of pumped storage (4 per cent), 7,958MW of solar photovoltaic (PV) (10 per cent), 11,442MW of wind (15 per cent), 11,930MW of gas (16 per cent), and 600MW of concentrated solar power (CSP) (1 per cent). The rooftop solar market is growing at a fast rate. The Mall of Africa's solar PV system is the largest rooftop solar PV system of its kind in the southern hemisphere and 10th-largest in the world, covering an area of approximately 45,000m^2. The solution is estimated to produce 78,000MW annually, at a construction cost of over 50 million rand. Although the regulatory regime in South Africa does not currently allow for excess energy to be sold back into the grid, as is the case in certain parts of the United States, the sponsors (Solareff, Attacq and Atterbry) together with the National Energy Regulator of South Africa and Eskom successfully worked through a lengthy legal process to ensure lawful compliance and successful synchronisation of the system with the national grid through Eskom's grid access framework. The Mall of Africa has no doubt been a game changer for rooftop PV in South Africa, and a change in the regulatory regime allowing excess energy to be sold back into the grid would be most likely to stimulate the rooftop solar market.

There are currently no significant tax incentives or other government-led programmes that mirror those in the United States or the European Union that have fostered the growth of renewables to such an extent in those markets. Large-scale retailers (like the Mall of Africa) are now installing large rooftop solar facilities to reduce their reliance on Eskom as a supplier and what is perceived as ever increasing above-inflation tariff costs. Furthermore, reflecting international market trends, a number of international corporate entities are looking at renewable off-grid solutions. We expect this off-grid market to continue to grow, which presents a challenge for Eskom as its customer base continues to shrink.

II THE YEAR IN REVIEW

The year 2018 brought with it positive change in respect of a transformation in the South African energy sector in relation to renewable energy. As discussed above, the IRP was released for public comment during August 2018. This plan provides for a dynamic energy mix that outlines South Africa's national energy road map and is a great improvement on the former draft IRP, which was approved by Parliament in December 2017 but sent back for processing for reasons that were not disclosed. During 2018, there were announcements made by the Minister of Energy that South Africa would launch a fifth Renewable Energy Independent Power Producer Procurement Programme, which would result in the addition of a further 1,800MW to the national grid. However, this has yet to come to fruition as many believe the stagnation of the launch of the bid 5 window is a result of state-owned utility Eskom's instability and financial woes, and the updated IRP not having been signed into law yet.

During 2018, Eskom announced that it is preparing to roll out 360MW of battery energy storage systems financed by the African Development Bank and the World Bank, which will consist of supplying, installing and operating distributed battery storage infrastructure at Eskom substations, including substations located at existing Variable Renewable Energy plants operated by Eskom's Renewables Unit (including the African Development Bank-funded 100MW Sere wind farm), upcoming distributed solar PV to be implemented by Eskom Distribution, and the new REIPPPP sites.

III THE POLICY AND REGULATORY FRAMEWORK

i The policy background

There are very limited government-led regulatory and tax incentives for renewables. As already noted, the current regulatory regime in South Africa does not allow for excess electricity from renewable sources such as residential or rooftop solar to be sold back to the grid, and a reform to allow for this would stimulate and promote faster growth in the rooftop solar market. The situation is compounded by the absence of significant tax incentives or other government-led programmes to foster development of the renewables market. Nor are there any tariff top-up arrangements like those seen in renewable energy programmes elsewhere in Africa, such as the successfully implemented GET FiT programme in Uganda. Although feed-in tariffs were initially proposed in South Africa, these were superseded by the auction process now known as REIPPPP, which has proved hugely successful, with each further round being heavily oversubscribed.

As from 1 January 2016, Section 12B of the Income Tax Act (South Africa) No. 58 of 1962 (the Income Tax Act) changed the three-year accelerated depreciation allowance on renewable energy (50 per cent to 30 per cent to 20 per cent) to an even quicker depreciation allowance of one year (100 per cent). This accelerated depreciation allowance came about from a proposal in the 2015 draft Taxation Laws Amendment Bill that the definition of solar energy be amended to distinguish between solar PV energy of more than 1MW, solar PV energy of less than 1MW and concentrated solar energy. The amended Section 12B provision now provides for an accelerated capital allowance of 100 per cent in the first year, in respect of solar PV energy of less than 1MW.

The reason for the change is to accelerate and incentivise the development of smaller solar PV energy projects, as these have a low impact on water and the environment. This is also intended to help address the energy shortages facing South Africa in a more environmentally friendly way.

Section 12B of the amended Income Tax Act provides for a capital allowance for movable assets used in the production of renewable energy. More specifically, it allows for a deduction equal to 100 per cent in respect of any plant or machinery brought into use in a year of assessment for the first time and used in a process of manufacture or any other process of a similar nature. Notably, the allowance is only available if the asset is brought into use for the first time by the taxpayer. In other words, the allowance is not limited to new or unused assets. The wording merely prevents the taxpayer from claiming the Section 12B allowance twice on the same asset.

With this incentive, companies can deduct the value of their new solar power system as a depreciation expense from its profits.

At the time of writing, the Carbon Tax Act 15 of 2019 (the Carbon Tax Act) had been signed into law. The Carbon Tax Act provides for a basic tax-free threshold of around 60 per cent of emissions and additional allowances for specific sectors that may result in tax exemptions for up to 95 per cent of emissions during the first phase until 2022. The full carbon tax rate is proposed to be 120 rand per tCO2e, after exemptions. The effective tax rate is expected to be between 6 and 48 rand per tCO2e.

The updated draft IRP has provided for a small allocation of 1 per cent to the CSP technology under REIPPPP. The CSP technology is seen to provide much higher costs compared with solar PV and wind. The challenge of intermittency is likely to be solved by the ever increasing introduction of battery solutions; it is unclear, however, on what scale this can be financed in the local marketplace.

ii The regulatory framework

In South Africa, the regulation of electricity from renewable sources falls under the jurisdiction of the National Energy Regulator (NERSA), one of three energy regulators established under the National Energy Regulator Act 2004 (NRA), which regulates electricity, piped gas and petroleum pipeline industries. Eskom's tariffs are regulated by NERSA under the Electricity Regulation Act 2006 (the Electricity Regulation Act). These tariffs are based on Eskom's costs plus a reasonable rate of return.

The NRA, together with other key legislation regulating the relevant industries (in the case of electricity, the Electricity Regulation Act) establishes the framework for renewable energy regulation in South Africa. That legislation, together with associated regulations, notices, rules and guidelines, grants expansive regulatory power to the regulators, including the powers to issue, amend and revoke licences, as well as to approve tariffs.

Under the Electricity Regulation Act, a licence is required for each operation (i.e., for electricity generation, transmission and distribution facilities, and in respect of the import, export and trading of electricity – collectively, the Licensed Activities), but it provides exemptions for licences in respect of (1) any generation plant constructed and operated for demonstration purposes, (2) any generation plant constructed and operated for own use, (3) any non-grid-connected electricity supply other than for commercial use, and (4) any other activity relating to the Licensed Activities for which NERSA has determined that a licence is no longer required. In relation to the latter exemption, NERSA may require that persons undertaking the activity concerned nevertheless register it with NERSA.

A person obliged to hold a licence in terms of the Electricity Regulation Act must apply to NERSA for the licence in the form, and applying the procedure, prescribed. The application must be accompanied by the prescribed licence fee. The information required for such an application includes, among other things:

a a description of the applicant, including any vertical and horizontal relationships with other persons engaged in the operation of the relevant Licensed Activity;
b the administrative, financial and technical abilities of the applicant;
c a description of the proposed generation, transmission or distribution facility to be constructed or operated;
d a detailed specification of the services that will be rendered under the licence;
e a general description of the type of customer to be served;
f the proposed tariff and price policies; and
g evidence of compliance with the IRP.[2]

The process entails publication of notices of the application in appropriate newspapers or other media and the applicant responding to objections to the application being granted, and it culminates in NERSA making a decision on the application within the prescribed period.

Transfer of control and the assignment of a licence issued in respect of Licensed Activities, including generation licences issued to IPPs, are restricted by conditions imposed on the licensee by NERSA.[3] Accordingly, each licence must be reviewed on a case-by-case basis to determine what specific approvals are required for its transfer. However, the Electricity Regulation Act generally provides that a licensee may not cede or transfer its powers or duties under a licence to any other person without the prior consent of NERSA.

2 Section 10(2)(a)–(h) of the Electricity Regulation Act 2006.
3 Section 15(1)(k) of the Electricity Regulation Act 2006.

The transfer of control and the assignment of licences issued to IPPs are further regulated by the implementation agreement between the South African DoE and the IPP; that agreement provides for, inter alia, government support for the development and financing of relevant IPP projects.

The initial IRP sets out the South African government's strategy for the establishment of new generation and transmission capacity for the country for the period 2010 to 2030. It calls for the doubling of the country's electricity capacity from its 2010 level of 238,272GWh, using a diverse mixture of energy sources, mainly coal, gas, nuclear and renewables, and including large-scale hydro to be imported from other countries in the southern African region. The initial IRP further details how this demand should be met in terms of generating capacity, type, timing and cost. The initial IRP also serves as an input to other government planning functions, inter alia, economic development, funding, and environmental and social policy formulation; it is also a means to determine the requirement for further investment in electricity generation capacity for South Africa.

At the time that the IRP was initially promulgated, the South African government advised that the IRP should be viewed as a 'living plan' that would be revised by the DoE every two years to ensure its relevance with regard to (among other things) technological and environmental developments in the global arena. An update to the IRP was provided for public comment in August 2018; however, this document has yet to be submitted to the cabinet for approval. It became necessary to revise the initial IRP following capacity additions through ministerial determinations[4] under Section 34 of the ERA, and to bring up to date key assumptions that have changed significantly since the promulgation of the initial IRP. Although the Minister of Energy released a draft of an updated Integrated Energy Plan (IEP), a subsequent draft has not been provided for public comment. The IEP serves as the government's master plan for the entire energy system, with its focus on the broader objective of reducing the country's energy footprint overall. The IEP regulates energy industries and promotes electric power investment, greater employer benefits and a more favourable environmental impact. The IRP on the other hand, being subordinate to the IEP, focuses specifically on electricity.

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

i Project finance transaction structures

A large percentage of the project financing activity for renewable energy projects has occurred within the framework of REIPPPP and the Small Projects Independent Power Producers Procurement Programme. While the project finance structure that has been adopted to date follows international norms, there are a number of unique features imposed on sponsors under REIPPPP, including localisation requirements that cover the development of specific categories of people, enterprises and communities or economic sectors. The following broad categories are covered:

a job creation;
b local content;
c ownership;

4 A complete list of ministerial determinations can be found under appendix B of the updated Integrated Resource Plan.

d management control;
e preferential procurement; and
f enterprise development and socio-economic development.

In terms of documentation, these follow international norms, with financing documentation largely following Loan Market Association precedents. Security packages typically include the following:

a borrower guarantee and share pledge;
b borrower cessions of its rights, title and interests in respect of aspects such as the project documentation, insurance proceeds, claims, licences, permits and authorisations under the transaction;
c general notarial bond, which is a registered security over all the movable assets of the borrower;
d special notarial bond, which is a registered security over specified movable assets of the borrower; and
e mortgage bond, which is a registered security over the borrower's land rights.

Construction, operation and maintenance agreements also largely follow international norms with engineering, procurement and construction contracts and operation and maintenance contracts closely following what one would expect to see in established markets. Internationally accepted standard construction contracts such as a FIDIC Silver Book are common (amended though to tailor for market norms and certain testing and performance complexities relative to each renewable energy technology).

To date, the vast majority of debt has been provided by the large five domestic commercial lenders (Rand Merchant Bank, ABSA, Nedbank, Standard Bank and Investec) with some participation from development finance institutions and pension funds (DBSA, PIC, IDC, etc.). International institutions such as the International Finance Corporation and the Organization of the Petroleum Exporting Countries have also been involved with financing a number of large renewable projects.

Aside from a large number of Enel projects (the Italian national utility) in Round 3 of REIPPPP, almost all projects have been financed on a limited or non-recourse basis.

While debt tenors vary, they are typically around 15 to 17 years (from commercial operation date) and spreads on the Johannesburg Interbank Agreed Rate are between 310 and 400 points (risk premium 250, liquidity 120 and statutory costs 30 points).

ii Distributed and residential renewable energy

Eskom, in its position as the national utility, is also the primary licensed distributor of electricity in South Africa. As was mentioned above, the current regime does not allow excess electricity to be sold back to the grid from renewable sources as it would be in jurisdictions such as the United States or the European Union, and a change in the regulatory regime would stimulate the rooftop solar market and allow it to grow far more quickly. There is also no regulated framework for use-of-system charges for embedded generators (connected to the distribution network). NERSA is, however, in the process of developing a framework for generators.

Generators that wish to wheel energy to third parties face a number of challenges related to the use-of-system charges.

iii Non-project finance development

The appetite in the market for on-balance sheet, corporate, full equity finance is extremely small. Almost all developers and sponsors of renewable projects in South Africa adopt a project finance structure.

V RENEWABLE ENERGY MANUFACTURING

The implementation of REIPPPP resulted in a significant portion of the technical equipment being imported from Europe and China. However, the increased local demand has stimulated the desirability and growth of component manufacturing for the renewable energy sector in South Africa. More recently, there has been an increase in the number of wind turbine and solar panel manufacturing plants built in South Africa, and several of these manufacturers have taken full advantage of the benefits offered to entities operating within the specifically demarcated South African Special Economic Zones (SEZs). These specifically demarcated SEZs have been set up to encourage trade and investment that create employment opportunities in South Africa and ultimately benefit the South African economy, and there are SEZs that have positioned themselves for investment in renewable energy power generation and manufacturing plants, such as the East London Industrial Development Zone.

There is a small number of solar and wind turbine equipment manufacturers currently taking advantage of the favourable SEZ laws. The Coega Industrial Development Zone, which was formed in 1999 and is located 20 kilometres north of Port Elizabeth in the Eastern Cape province of South Africa, has attracted three manufacturers of solar and wind turbine equipment, namely DCD Wind Towers, Electrawinds and Powerway. There are concerns that when these components are exported from these SEZs into South Africa, the customs and VAT levied on the components will be based on the value of the components, including South African raw materials and labour costs. This could result in a higher cost for South African customers as compared with components manufactured wholly offshore and imported directly into South Africa.

The Coega Industrial Development Zone is currently positioning itself to become the solar and wind turbine equipment hub for the Eastern Cape, as there are several renewable energy projects being proposed there. The East London Industrial Development Zone is also positioning itself to manufacture and supply electricity from renewable energy sources in the Eastern Cape Industrial Development Zones. This Industrial Development Zone has advertised that it has suitable land for electricity generation from both wind and solar facilities, with established relations with the top 100 users and the local authority for connection of the power plant to the grid and supply of electricity to the nearby Buffalo City metropolitan municipality.

VI CONCLUSIONS AND OUTLOOK

The future looks very positive for renewable energy and the much-anticipated revised draft of the IRP will help clarify which energy sectors the new South African government will be supporting in the years to come.

Chapter 15

SPAIN

Hermenegildo Altozano[1]

I INTRODUCTION

Following the political turmoil resulting from the unexpected, and successful, motion of censure (vote of no confidence) on 1 June 2018 – with the governing conservative Popular Party being replaced by the Spanish Socialist Workers' Party (PSOE) – the new government adopted a number of legislative measures affecting the development of renewable energy projects in Spain. The general election held on 28 April 2019 resulted in another term for a PSOE-led government. Although the party does not have a majority in Parliament, development of renewable energies is expected to continue to meet the targets of the Strategic Energy and Climate Framework, which is based on three pillars: the proposed Climate Change and Energy Transition Law, the National Integrated Energy and Climate Plan 2021–2030, and the Just Transition Strategy. These three pillars are expected to be approved in the coming months.

As regards renewable energy, the proposed Climate Change and Energy Transition Law establishes that the government will convene auctions to grant economic incentives to promote the commissioning of at least 3,000MW of renewable facilities each year. Obviously, these significant objectives require certain measures to facilitate the integration of intermittent and non-manageable technologies into the existing system. To this end, hydropower plants (particularly reversible hydropower plants) will play a significant role.

The new Climate Change and Energy Transition Law is also expected to take into consideration conclusions of the report prepared by the committee of experts on energy transition appointed by the former Ministry of Energy. Among other relevant measures, the committee's report proposes modifying the current financing of renewable energy projects, by means of a surcharge to be imposed on all sources of energy.

During the period between the vote of no confidence and the general election of 28 April 2019, the government was very active in relation to regulation of renewable energies, introducing a very ambitious self-consumption regime, which is meant to facilitate the development of renewable small-scale facilities (particularly photovoltaic (PV) solar).

In addition to introducing these specific measures promoting self-consumption (see below for further details), the new government is also expected to speed up the drafting and approval of the proposed Climate Change and Energy Transition Law, which is very likely to result in an incentive for renewable energies with a view to decarbonising energy production to comply with the Paris Agreement and EU targets. The new energy policy will result immediately in the closing of existing carbon power plants.

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II THE YEAR IN REVIEW

Installed following its successful vote of no confidence in the previous administration, the government undertook an intensive programme of regulatory activity regarding renewables, including the following measures:

a Royal Decree-law 15/2018, on urgent measures for energy transition and consumer protection, which has removed the existing regulatory obstacles for the development of self-consumption and has introduced the following three principal elements:
- recognition of the right to self-consumption of electricity without any charges (i.e., access tolls);
- recognition of the right to shared self-consumption of electricity; and
- the simplification of related administrative procedures.

b Royal Decree 244/2019, which regulates the administrative, technical and economic conditions for the self-consumption of electric energy, further develops the provisions of Royal Decree-law 15/2018.

These regulations have removed the obstacles presented by Article 9 of Law 24/2013 on the Electricity Sector, and Royal Decree 900/2015, which regulated the administrative, technical and economic conditions of the modalities of supply of electric energy with self-consumption, and of production with self-consumption, and which imposed a number of technical, administrative and economic barriers to electric energy self-consumption.

Another important development in relation to the development of renewable energies has been the publication by the National Commission on Markets and Competition (CNMC) of the methodology for the calculation of the reasonable rate of financial return for activities in the electricity sector for the period 2020–2025. According to the CNMC methodology, the reasonable return for the production of electric energy from renewable sources, cogeneration and waste is 7.09 per cent for the period 2020–2025. The methodology is based on the weighted average cost of capital (WACC) with the aim of guaranteeing a reasonable return to encourage suppliers of financial resources to fund the financing of renewable energy plants.

It should also be noted that the significant increase in the development of renewable energy projects is causing certain problems regarding access and connection of the new renewable energy installations to the distribution and transmission grids. To remedy this situation, the government is currently working on a decree regulating access and connection. The proposed legislation reaffirms the use of the grid-bond mechanism to secure access to the grid, and that access should be available under transparent, objective and non-discriminatory conditions.

As stated above, it seems likely that the new government will speed up the drafting and approval of the Climate Change and Energy Transition Law during the current term, and, following the report by the committee of experts on energy transition, will seek to reform the financing of renewable energy projects by imposing on all sources of energy a surcharge comprising the following elements:

a A first component that will reflect the overrun of the most efficient renewable energy facilities. However, given that the results of the most recent auctions indicate that overrun for renewable energy facilities is nil at current market prices, the first component of the surcharge will be also nil.

b A second, complementary, component that will reflect the overrun of renewable facilities installed in the past with a higher cost than the actual costs. This component should be financed by the state budget, although, if this is not possible, the surcharge may be imposed on all sources of final energy (and thus ultimately paid for by end consumers).

The following points are expected to be the main pillars of the new government's new energy policy:

a the closing of carbon power plants; and

b the fostering of renewable energy projects.

In the context of fostering renewables, the revision of the specific remuneration incentive for renewable energy plants is expected to be maintained at levels of 'reasonable return' similar to those applicable to date, in accordance with the new CNMC methodology (see Section III.i, below, for details of the Specific Remuneration Regime incentive scheme).

Apart from these recently announced developments, the main highlights of the past year in the Spanish renewables sector may be summarised as follows:

a an increase in the use of the 'project bond' mechanism (including green project finance bonds) to finance new renewable energy projects and to refinance existing renewable energy projects;

b new projects are to be financed on a 'merchant' basis (rather than on the basis of a feed-in tariff or premium);

c an increase in the number of corporate power purchase agreements (PPAs) entered into in the past year, with some recent PPAs with a tenor of 20 years;

d the consolidation of the interest of infrastructure funds in acquiring renewable energy companies or assets in Spain and, in this context, the following major transactions are of note:
- Ardian's acquisition of Renovalia's wind farms from Cerberus and BlackRock;
- Brookfield's acquisition of 50 per cent of X-Elio from KKR; and
- Luxcara's acquisition of a PV solar portfolio from Forestalia;

e an increase in the interest of major incumbents (e.g., Iberdrola, Naturgy, Endeesa) and oil and gas companies (e.g., Repsol and Cepsa) in the development of renewable energy projects; and

f landmark international arbitration awards made against the Kingdom of Spain as a result of the systemic change introduced by Royal Decree-Law 9/2013 (in 2018, three arbitration courts ruled against Spain and in favour of the foreign entities Novenergia, Eiser, Masdar, Antin Infrastructure, REEFF and Foresight in relation to renewables incentives).

Finally, it should be noted that the first regulatory period for renewable energy installations receiving the specific remuneration incentive will end in December 2019 and, consequently, the parameters for the remuneration structure of renewable energy projects may be subject to revision in accordance with the new CNMC methodology.

III THE POLICY AND REGULATORY FRAMEWORK

In the recent past, Spain undertook a radical systemic overhaul of the legal regime for the renewable energy sector by adopting the following pieces of legislation:

a Royal Decree-Law 9/2013, of 12 July 2013, adopting urgent measures to guarantee the financial stability of the electricity sector (RDL 9/2013);

b Law 24/2013, of 26 December 2013, on the Electricity Sector (Law 24/2013);

c Royal Decree 413/2014, of 6 June 2014, governing the generation of power through renewable energies, generation and waste (RD 413/2014), and establishing the Specific Remuneration Regime (see Section III.i);

d Ministerial Order IET/1045/2014, of 16 June 2014, establishing the remuneration parameters for installations for the generation of power through renewable energies, cogeneration and waste (Order 1045/2014); and

e Ministerial Order IET/1459/2014, of 1 August 2014, approving the remuneration parameters and establishing the award mechanism for the Specific Remuneration Regime for new wind and PV solar installations in the Spanish non-peninsular territories (i.e., the Balearic Islands, Canary Islands, Ceuta and Melilla).

Notwithstanding the consequences of these radical reforms, and the prospect of the above-noted changes likely to be pursued by the new government, operators in the sector have adjusted to the new regulatory framework, and the renewable energy industry is now experiencing significant development following publication of the government's plans to achieve 42 per cent of electricity consumption from renewable sources by 2030.

i The Specific Remuneration Regime

Replacement of the feed-in tariff scheme by the Specific Remuneration Regime

Pursuant to RDL 9/2013 and RD 413/2014, the former feed-in tariff (FIT) scheme in place under the special regime applicable to electricity produced from renewable energy sources (the Special Regime) was replaced by the Specific Remuneration Regime, which introduced a remuneration complement called the 'specific remuneration', to be paid on top of the electricity market price. The following are the main differences between the FIT and the specific remuneration:

a While the FIT was applied to the entire electricity production of a renewable energy plant without any limitation – the higher the production, the higher the revenues – the specific remuneration is paid on the basis of the installed power capacity of the PV plant and, as detailed below, is limited to the amount necessary to cover the 'costs required to compete on the market on an equal footing with other technologies, as well as to obtain a reasonable rate of return'.[2]

b The FIT was fixed (subject only to periodic adjustments in relation to the consumer price index) and remained stable for 25 or 30 years from the commercial operation date, depending whether the renewable energy plant was governed by RD 661/2007 or RD 1578/2008 (in the case of PV solar installations). In contrast, the specific remuneration is subject to periodic revisions every three and six years following the procedures detailed below, with the next regulatory review due in December 2019.

c Finally, the FIT was determined by the technology and the commercial operation date of each particular installation, while the specific remuneration is calculated in relation to a hypothetical determination of the parameters of each installation according to different categories of 'standard facility' – a concept that plays an essential role in the calculation of the specific remuneration (see below).

2 Article 14 of Law 24/2013.

Components of the specific remuneration

In exchange for electricity generated from renewable sources, renewable energy installations now receive the market price (payable by the Spanish electricity network upon receipt of the power produced from the plant) plus the specific remuneration, consisting of:

a a return on investment (RI), which is calculated in relation to the installed power capacity of the plant plus enough to cover, if necessary, the investment costs of a standard facility (as detailed below), provided that those costs are non-recoverable through the sale of electricity at market price; and

b a return on operation (RO), which will cover the difference, if any, between the operating costs of the standard facility and the revenues of the standard facility from the sale of electricity at market price.

The calculation of the specific remuneration is made for the entire regulatory life term of the installation (pursuant to Order 1045/2014).

Reasonable rate of return

The reasonable rate of return is the cornerstone of the Specific Remuneration Regime.[3] To this end the specific remuneration shall not exceed the minimum level necessary to cover the costs, thus enabling the undertakings or sponsors of renewable energy plants to compete on equal terms with undertakings using other technologies; and this reasonable return is to be calculated in relation to a standard facility.

The reasonable rate of return shall be calculated, before taxes, on the interest rate yielded by 10-year Spanish government bonds plus a given spread. As explained above, the new CNMC methodology bases the calculation of the reasonable rate of return on the WACC.

The role of the standard facility

The specific remuneration is not calculated on a case-by-case basis but by reference to a standard facility, which will apply to one or many installations with standard, uniform or similar characteristics.

The different categories of standard facility (referred to as IT categories)[4] and the applicable economic parameters are detailed in Order 1045/2014. These parameters will vary according to the technology, the power capacity, the commercial operation date and other relevant features of the installation.

The specific remuneration applicable to a particular installation will depend on the economic parameters corresponding to the relevant IT category.

3 Under the Special Regime, the 'reasonable rate of return' was an undetermined or undefined concept introduced by Law 54/1997, which ensured that the economic regime or feed-in tariff would guarantee at least this reasonable rate of return (thus functioning as a minimum threshold). Under the Specific Remuneration Regime, the reasonable rate of return is no longer an undefined term but is now a concrete element of the formula, and one that constitutes a true cap on the regulated remuneration payable to the project. Therefore, once the photovoltaic (PV) plant has reached the cap fixed at the reasonable rate of return (which is determined by regulation), the PV plant will have no further right to receive the specific remuneration.

4 *Instalación tipo*, i.e., 'standard installation' or 'standard facility'.

Temporary character of the specific remuneration: regulatory periods

The specific remuneration is calculated for a regulatory period of six years, divided into two three-year regulatory half periods. The first period runs from 14 July 2013 to 31 December 2019.

During each regulatory half period and regulatory period, the specific remuneration is subject to corrections and adjustments linked to different factors, such as the number of operating hours in a given year or the electricity market price. Furthermore, the economic parameters of the specific remuneration (always corresponding to an IT category and thus to a standard facility) might be adjusted annually by the regulator (i.e., the CNMC) and reviewed by the government at the end of a regulatory period or regulatory half period (i.e., every six or three years, as the case may be).

Economic parameters of the specific remuneration

The economic parameters of the specific remuneration are as follows:

a the RI: calculated per power unit (€/MWh);

b the RO: applicable to those technologies with estimated operation costs per power unit higher than the average market price;

c the regulatory life term: the specific remuneration shall be paid during the regulatory life term of the standard facility (as determined in the corresponding IT category). The installation might be still generating power after the expiry of the regulatory life term, but this will only be remunerated at market price (i.e., it will no longer have any right to the specific remuneration incentive);

d the net value of the asset: equal to the value of investment of the standard facility per power unit at the initial regulatory half-period life term, and calculated according to the methodology included in Annex VI of RD 413/2014; the formula for the calculation of the net asset value includes the standard value of the initial investment.[5]

Order 1045/2014 establishes the value of the initial investment for each IT category, and this value remains unaltered throughout the regulatory life term of the installation. Note that, pursuant to Article 13 of RD 413/2014, the calculation of the net asset value does not take into account any costs arising from applicable regulations or administrative decisions issued by relevant regions or municipalities but not throughout the whole territory of the Kingdom of Spain; for instance, compensation payable to municipalities for the use of land protected from urban development, and provided for in regional town and country planning laws, would not be included as a cost for the purposes of calculating the net asset value.

Specific remuneration correction and update mechanisms

The first regulatory period fell between the entry into force of RDL 9/2013 (14 July 2013) and 31 December 2019. Therefore, the first regulatory half period ran from 14 July 2013 to 31 December 2016.

5 As part of the formula for the calculation of the return on investment, RD 413/2014 (Article 16.2) includes the net asset value as one of the items to be calculated. Furthermore, the net asset value is further calculated according to the formula laid down in Annex VI of RD 413/2014, which takes into account the standard value of the initial investment.

The specific remuneration shall be reviewed after each regulatory period and each regulatory half period. In this context, note that all the economic parameters set out by Order 1045/2014 for each IT category can be modified, with the sole exception of the regulatory life term and the standard value of the initial investment. Note that the reasonable rate of return, although not an economic parameter, is also subject to periodic revision at the end of every regulatory period. The applicable spread may also be modified by means of a law.

The adjustment mechanisms[6] of the specific remuneration[7] are as follows:

a adjustment of the specific remuneration (i.e., the revenues obtained by the relevant plant) as a result of the number of equivalent operating hours; and

b adjustment because of market price deviations.

The periodic review and update mechanisms of the specific remuneration parameters established in RD 413/2014 are as follows:

a review of the differential applicable for the determination of the reasonable rate of return;[8]

b review of remuneration parameters;[9] and

c review of the standard income[10] from the sale of electricity.[11]

In summary, the adjustments made annually to the specific remuneration reflect factual matters that occur during the year, namely the number of equivalent operating hours of the standard facility during the year (e.g., whether the number of hours is lower or higher than originally expected because of climate conditions) and the market price deviations (e.g., if there is an increase in the market price because of a higher demand for power, the specific remuneration should 'complement' the price paid for the electricity and not increase it, therefore the specific remuneration might be lowered if the price of the electricity increased during the year).

In contrast, the periodic reviews are aimed at revisiting the parameters of the specific remuneration in light of other criteria (irrespective of factual matters regarding energy

6 Note that the mechanism established by RD 413/2014 sets out two types of review and adjustment: (1) adjustments on a yearly basis aimed at correcting the specific remuneration (adjustments due to the number of equivalent operating hours for the year and market price deviations, which will result in the adjustment of the annual revenues obtained by the relevant plant); and (2) review after a regulatory half period or regulatory period of the value of certain parameters within the formula for the calculation of the specific remuneration. Adjustments will only stand for a year, whereas the reviews will stand for the entire regulatory half period or regulatory period, as the case may be.

7 Note that the application of the mechanism adjustment may result in an increase or decrease of the specific remuneration set out in RD 413/2014.

8 Note that the differential applicable for the determination of the reasonable rate of return may be reviewed after each regulatory period.

9 Note that the remuneration parameters (except the regulatory life term and the standard value of the initial investment) may be reviewed after each regulatory period.

10 Note that the 'standard income from the sale of electricity' is a pre-estimate of the income that the standard facility (in usual conditions) should receive for the sale of electricity, which is different from the income adjusted on account of market price deviation, which only takes into account the actual deviations that the price of electricity has undergone during a given year (as these market price deviations might have an impact on the actual specific remuneration payable in that year).

11 Without prejudice to a more detailed description in Table II of Schedule 2, note that the standard income from the sale of electricity may be reviewed after each regulatory half period.

production), such as the overall evolution of the Spanish economy. As the reviews imply a more in-depth analysis of the applicable specific remuneration overall, their frequency is limited to three to six years (depending on whether the relevant parameter is to be reviewed each regulatory half period or each regulatory period).

ii Policy background

See the preceding section for details of the policy background.

iii Regulatory framework

The general regulation of renewable energy (and particularly the economic regime) is the responsibility of the Spanish Parliament and is developed by the central government through royal decrees, and by the Ministry of Energy and Industry through ministerial orders and resolutions. The Spanish autonomous regions are entitled to regulate the development of renewable energy projects and may introduce additional requirements in relation to projects to be developed in the relevant territories.

As provided for in Law 3/2013 of 4 June 2013, the independent regulator, the CNMC, plays a significant role in the development of renewable energy projects. To this end, the CNMC has, inter alia, the following authority:

a to establish, by means of circulars, the toll calculation methodology;

b to supervise the management and allocation of connecting capacity, the time spent by transmission and distribution companies in carrying out connections and repairs, and the mechanisms designed to ease congestion in network capacity;

c to supervise the conditions and charges for connection applicable to new producers of electricity;

d to manage the system for guaranteeing the origin of electricity from renewable sources and from high-efficiency cogeneration;

e to publish the end prices of the electricity market, based on information from the market operator and system operator;

f to issue reports in applications for authorisation, amendment or closure of facilities, in the process of energy planning, and in applications for approval or authorisation of economic or remuneration regimes;

g in relation to legislation on energy, to issue circulars to implement and enforce rules contained in royal decrees and in orders of the Ministry of Industry, Energy and Tourism, which authorises the CNMC for that purpose; and

h to perform any other functions that may be conferred on it by act or royal decree.

iv Procedural requirements

The development of renewable energy projects requires fulfilment of the following steps.

Access and connection to transmission and distribution networks

To obtain access to and connection permits for transmission and distribution networks, the following conditions apply:

a Prior to any request for access to the grid, a grid bond should be deposited with the central government or with the autonomous region (as applicable) for an amount of €10/kW. This grid bond shall be cancelled upon obtaining the relevant authorisation for commissioning.

b Access and connection permits shall last for five years. If the relevant installation ceases to pump electricity into the grid for more than three years (other than as a result of temporary closure of the facility), the relevant permits shall expire.

Substantive administrative permits

The following administrative permits are required for the construction and commissioning of renewable energy plants:

a preliminary administrative permit: this permit is managed together with the environmental impact assessment and allows the construction of a specific installation under specific conditions, and establishes the time frame for the request of the approval of the relevant project;

b administrative authorisation for construction: allows the construction of the relevant installation. The developer should submit a construction project together with a responsible declaration evidencing compliance with the applicable rules. It is possible to manage and obtain the administrative authorisation for construction and the preliminary administrative permit simultaneously. Note that the environmental impact assessment should be granted prior to the administrative authorisation for construction; and

c authorisation for exploitation: once the project is executed this authorisation permits installations to be connected to the grid and commercial exploitation to commence.

The authority to grant these authorisations lies with the General Directorate of Energy Policy and Mines (DGPEM) in relation to installations with a capacity over 50MW or when they exceed the territorial limits of one autonomous region. In other cases, the authority to grant the authorisation lies with the relevant autonomous regions. The term for the grant of the relevant authorisations is one year for those granted by DGPEM and six months in other cases. If no permit is granted within this term, it shall be deemed that the request has been denied.

Contracts with grid operators

The developers of renewable energy plants ought to enter into a contract to regulate the technical relationship between them and the relevant distribution company. The contract should regulate at least: (1) connection and measurement points; (2) quantity and quality features of the energy supplied (capacity, forecast of production); (3) grounds for termination or amendment of the contract; and (4) conditions for the exploitation of the connection.

Specific Remuneration Regime Registry

A necessary condition of eligibility for the Specific Remuneration Regime is that the installations are registered with the Specific Remuneration Regime Registry. This registration has two phases: pre-assignment status and exploitation status. The authority to approve the Specific Remuneration Regime registration lies with DGPEM. Following the most recent auctions, the registration procedure has been as follows:

a Specific Remuneration Regime registration with pre-assignment status: once the result of the auction has been published, the relevant projects should be registered with the Specific Remuneration Regime provided that the relevant developers have deposited the corresponding guarantee (€60/kW). DGPEM then has three months to formulate and

issue the resolution to register the projected installations with pre-assignment status. This term may vary in each auction. The developer then has 12 months to submit the construction authorisation to DGPEM.

b Specific Remuneration Regime registration with exploitation status: once the plants concerned have been built within the term established by DGPEM, the developers should request Specific Remuneration Regime registration with exploitation status within one month of completion of construction.

Administrative Registry for Production Installations under the Special Regime

All installations for the production of electric energy (whether receiving the specific remuneration or not) should be registered with the Administrative Registry for Production Installations under the Special Regime (RAIPRE). The procedure for RAIPRE registration consists of two phases: preliminary (once the authorisation for provisional exploitation for testing is obtained and the technical contract with the grid has been entered into) and final registration (once the authorisation for final exploitation has been obtained). Both the preliminary and the final registration shall be agreed within one month of the registration request.

The authority for approval of the registration lies with the same authority that is competent for the granting of the administrative authorisation (i.e., DGPEM or the relevant body in the applicable autonomous region).

In addition to the above requirements, it is necessary to obtain the relevant environmental authorisations and licences to be granted by the relevant autonomous region, as well as municipal licences for works and operation. Depending on the location of the relevant plant, certain additional licences may also be required (e.g., use of public waters, rights of way or passage, easements).

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

Project finance transaction structures

The typical structure for developing renewable projects in Spain consists of the incorporation of a special purpose vehicle (SPV) that will become the holder of the relevant renewable energy project. In the case of a joint project undertaken by a group of entities, a holding structure with a number of SPVs is often used.

Although in the past financial institutions have shown a bigger appetite for projects with a FIT, the change of regime and the increasing number of non-FIT projects have turned the attention to merchant project finance. Increasingly corporate PPAs are used as an additional element to bring stability and predictability in the cash flows and mitigate any potential uncertainty represented by the Specific Remuneration Regime and the three- and six-year revisions.

In the case of existing projects, the new regime has introduced a number of changes and amendments to existing documentation, although the structure of this documentation (facility agreement, security agreement, base-case and swap agreements) remains similar. Commercial banks and development banks are the main participants providing financing for new projects, although project bonds are an instrument used increasingly by developers.

The main changes under the new regime are as follows:

a Review and amendment of operation and maintenance (O&M) contracts: as some of the regulatory changes have impacted on the customary scope of work for O&M contracts, a review has largely been used to redefine the services required under the new O&M contracts.

b Cash-sweep mechanism: in addition to the payment cascade mechanisms to provide for the retention of any available cash if the debt service coverage ratio falls below the agreed thresholds, a general cash-sweep mechanism has been introduced so that any excess cash (or at least a portion thereof) is retained by the financing entities to be applied to the early repayment of the facility, so that the base case is rebalanced and improved annually. It might be agreed, as an alternative, to limit the cash-sweep mechanism as needed to fulfil the terms of the base case following the review or adjustment of the specific remuneration. Through the cash-sweep mechanism, the financing entities would ensure that excess cash (if any) is available following an unfavourable review of the specific remuneration.

c Extension of the tenor: depending on the term of the regulatory life of each particular renewable energy plant, the tenor of the facilities may have been extended.

d Review and adjustment of the quotas or instalments at each regulatory half period or regulatory period: as explained above, the regulatory changes have introduced a mechanism for the review or adaptation of the specific remuneration at the end of each regulatory half period or regulatory period. By definition, the reasonable rate of return and other parameters may be reviewed and lowered from one regulatory half period or regulatory period to another and, thus, existing projects may have less income available to repay applicable instalments under existing facility agreements for the subsequent regulatory half period or regulatory period if, as a result of the review, the remuneration for the plant is lowered. To avoid any defaulting scenarios, and to increase certainty for the financing entities that the relevant obligor will be capable of adapting to any changes in the specific remuneration resulting from a review or adjustment at the end of a regulatory half period or regulatory period, the relevant financing agreements may (1) set out a mechanism for the review and adjustment of the relevant instalments (together with the tenor of the facility) at the beginning of each regulatory half period or regulatory period and (2) establish a shareholder support mechanism, whereby direct or indirect shareholders of the relevant SPV would commit to repay any shortfall in the instalments (through the regulatory half period or regulatory period) as necessary, by using (1) any available cash according to the cash-sweep mechanism; or (2) any additional equity that the relevant guarantors should contribute (as subordinated debt or share capital) to the relevant SPV.

V CONCLUSIONS AND OUTLOOK

Despite announcements by the former government proposing a 30 per cent haircut for the specific remuneration applicable to renewable energy installations, the energy policy of the new government makes it unlikely that significant changes will occur in the next revisions, due in December 2019. The methodology issued by the CNMC serves as a guide for the revisions, with the calculation of the reasonable return being based on the WACC.

The need to comply with the Paris Agreement and the EU 'Winter Package' regulations will result in an increase in the percentage of renewable energy in the Spanish energy generation

mix. In this context, a new set of auctions may be convened, although the growing number of merchant projects, coupled with corporate PPAs, will also contribute to an increase in the number of renewable energy projects. As to project financing, many analysts have pointed out the increased use of project bonds to finance new renewable energy projects.

The development of new renewable energy projects will raise other questions regarding, for example, the need to expand and reinforce the grid and to increase interconnections with Portugal and France.

Self-consumption is clearly favoured and significant development in this field is expected. Carbon power plants will be gradually decommissioned, although the useful life of nuclear power plants will probably be extended beyond 40 years, despite previous announcements to the contrary by the government.

Chapter 16

UNITED KINGDOM

John Dewar and Kilian de Cintré[1]

I INTRODUCTION

The UK's energy sector continues to undergo significant change. The 2018 Renewable Energy Directive set a target for the UK to achieve 32 per cent of its energy consumption from renewable sources by 2030. The Energy Act 2013 (the Energy Act), initially enacted to achieve the target set by the 2009 Renewable Energy Directive, implemented key aspects of Electricity Market Reform (EMR) – a policy initiative pioneered by the UK government to mobilise £110 billion of capital investment required by 2020 to ensure a reliable and diverse supply of low-carbon electricity. Reforms such as these are vital, as the UK has seen significant power plant closures in recent years; the Energy Act was aimed at ensuring both investment in infrastructure, alongside decarbonisation as more power plants are decommissioned in the UK. Around a fifth of the capacity that was available in 2011 will close by the end of this decade, and demand for electricity is set to increase as major sectors such as transport and heat are electrified.

To allay concerns that the EMR target would be lost on the UK's exit from the EU, in June 2016, the Conservative government announced the target of reducing carbon emissions by 57 per cent by 2030 and 80 per cent by 2050. These targets are informed by the UK's need to develop approximately 59GW of new net capacity by 2025, with as much as 33GW coming from renewables and the remaining 26GW coming from conventional thermal power. In an effort to promote private investment in the development of large-scale infrastructure projects (and in particular, the development of low-carbon technology) in the UK, the UK government has instituted a series of programmes that are specifically designed to stabilise the economics of financing for such projects.

II THE YEAR IN REVIEW

The UK's current electricity mix has changed substantially, and rapidly, over the past couple of years. Most notable is an increase in renewable-generated electricity (a trend in line with global patterns). In 2017, for the first time, Britain generated more electricity from renewable energy than from gas and coal. Renewable sources (wind, solar, hydro and biomass) together contributed just over 33 per cent of electricity generation in 2018, up from 29 per cent in 2017, with 111TWh of electricity generated from renewable sources. The Energy Trends report, published by the UK Department for Business, Energy and Industrial Strategy (BEIS) in March 2019, reported that renewable electricity capacity was 44.4GW at the end of 2018,

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a 9.7 per cent increase on 2017. Notably onshore and offshore wind generation rose by 4.6 per cent and 28 per cent respectively, with significantly increased capacity. Electricity generation in 2018 fell by 1.4 per cent from 339TWh in 2017 to 334TWh, with reduced generation from coal, gas and nuclear offset by an increase from renewables, with a 14 per cent increase from wind and solar generation and a 12 per cent increase in bioenergy generation.

During November 2016, the government published its plan to upgrade UK energy infrastructure, reaffirming its commitment to spend £730 million of annual support on renewable electricity projects, also setting out proposals for the next steps to phase out electricity generation from unabated coal-fired power stations within the next decade. This long-term plan is intended to provide confidence to investors that the UK is open to investment in new, cleaner energy capacity.

The second allocation process for the Contract for Difference (CfD) scheme for renewable generators began in April 2017, aiming to provide support for projects to be delivered between 2021 and 2023. There will be no allocation of CfD budget for onshore wind (except in remote islands) or solar, consistent with the government's view that these are mature technologies that should no longer be provided with subsidies. The only technologies supported will be offshore wind, certain forms of biomass or waste-fuelled plant (e.g., advanced conversion technologies, anaerobic digestion, biomass with combined heat and power (CHP)), wave, tidal stream and geothermal.

In June 2016, the UK voted to leave the European Union. Since then, the Conservative government has been negotiating with the EU, and has tabled the European Union (Withdrawal) Bill, which will replace the European Communities Act 1972 and make other provisions in connection with the withdrawal of the UK from the EU. It is the primary piece of legislation that will determine the UK's position in relation to current EU legislation post-exit. It also aims to remove the jurisdiction of the European Court of Justice over the UK courts. It will transfer all current EU law into UK domestic law, so that as smooth a transition as possible is achieved in the immediate aftermath of exiting the EU. It is seen as 'one of the largest legislative projects ever undertaken in the UK' by the House of Commons. In addition to the legislative overhaul and regulatory uncertainty, the vote to leave the EU creates uncertainty over the continued access of the UK to European Investment Bank funding, which until the vote had been an important source of funding for smaller-scale UK projects. During the transition period, it is likely that the UK will continue to be subject to EU procurement directives (such as the Public Contracts Regulations 2015 SI 2015/102). This means that organisations under the rules must continue advertising and awarding public contracts in accordance with the EU directives. It is unclear what the position will be regarding procurement post-exit and post-transition period.

III THE POLICY AND REGULATORY FRAMEWORK

i The policy background

Ofgem E-Serve administers several environmental schemes and consumer and social programmes on behalf of the government, including schemes related to renewable energy.

Introduced on 1 April 2010, the Feed-in Tariffs (FIT) scheme was a government programme designed to promote the uptake of small-scale renewable and low-carbon electricity generation technologies. The FIT scheme was available for solar photovoltaic,

wind, micro combined heat and power, hydro or anaerobic digestion technology up to a capacity of 5MW, or 2kW for micro combined heat and power. The FIT scheme closed to new generation capacity from 1 April 2019.

The provision of CfDs is one of the key policy measures to incentivise new low-carbon electricity generation. The provision of CfDs is intended to stabilise revenues for investors in low-carbon electricity generation projects such as renewables, by helping developers secure the large upfront capital costs for low-carbon infrastructure. The CfD is a quasi-power purchase agreement. Generators with a CfD will sell their electricity into the market in the normal way and remain active participants in the wholesale electricity market. The CfD then pays the difference between an estimate of the market price for electricity and an estimate of the long-term price needed to bring forward investment in a given technology (the strike price). When a generator sells its power, if the market price is lower than needed to reward investment, the CfD pays a top-up. However, if the market price is higher than needed to reward investment, the contract obliges the generator to pay back the difference. In this way, CfDs stabilise returns for generators at a fixed level for the duration of the contract. This removes the generator's long-term exposure to electricity price volatility, substantially reducing the commercial risks faced by these projects. The Energy Act includes a provision whereby a new UK government-owned company (the Low Carbon Contracts Company, or LCCC) will act as the counterparty to eligible generators under the CfD. This mechanism was in direct response to concerns about the 'credit' behind the CfD economics. Although a CfD is a private law contract between a low carbon electricity generator and the LCCC, the cost of CfDs will ultimately be met by consumers via a levy on electricity suppliers. Two offshore wind projects were awarded CfDs at £57.50/MWh in the 2017 round. A third round of CfDs is planned for May 2019. With up to £557 million made available for investment, BEIS announced that further allocation rounds would be held every two years starting from 2021. Eligible technologies are offshore wind, onshore wind in remote islands, certain forms of biomass or waste-fuelled plant (e.g., advanced conversion technologies, anaerobic digestion, biomass with CHP), wave, tidal stream and geothermal.

The Renewable Obligation (RO) scheme is one of the main support mechanisms for large-scale renewable electricity projects in the UK. Smaller-scale generation is mainly supported through the FIT scheme. The RO came into effect in 2002 in England and Wales, and Scotland, followed by Northern Ireland in 2005. The scheme places an obligation on UK electricity suppliers to source an increasing proportion of the electricity they supply from renewable sources. The RO scheme closed to all new generating capacity on 31 March 2017.

The Climate Change Levy (CCL) was introduced in 2001 and is a tax on UK business, collected by energy suppliers, designed to encourage energy efficiency, reduce carbon emissions and promote energy from renewable sources. Businesses were previously able to claim an exemption if they could show a levy exemption certificate, showing that they bought energy from qualifying renewable energy sources. In the July 2015 budget, the UK government announced the removal of CCL exemption for electricity generated from renewable sources from 1 August 2015.

The Offtaker of Last Resort (OLR) is a government scheme that aims to promote the availability of power purchase agreements (PPA). It is intended as a last resort to help renewable generators who cannot get a PPA through the usual commercial means. The OLR scheme is part of the government's wider programme on EMR.

ii The regulatory framework

The Department of Energy and Climate Change (DECC), formed in 2008, was the ministerial department responsible for making decisions, setting policy and implementing legislation affecting the electricity sector. The corresponding government ministry in Northern Ireland is the Department of Enterprise, Trade and Investment. Following the EU Referendum held on 23 June 2016, DECC was merged with the Department for Business and Innovation to create the Department for Business, Energy and Industrial Strategy (BEIS).

BEIS works closely with and is supported by other agencies and public bodies, including the Gas and Electricity Markets Authority (GEMA) and the Office of Gas and Electricity Markets (Ofgem).

GEMA has primary responsibility for regulation of the energy sector. GEMA's powers and duties are largely provided for in statute (such as the Gas Act 1986, the Electricity Act 1989, the Utilities Act 2000, the Competition Act 1998, the Enterprise Act 2002 and the Energy Acts of 2004, 2008, 2010 and 2011), as well as arising from directly effective European Community legislation. GEMA's principal objective is to protect the interests of existing and future consumers in relation to gas conveyed through pipes, and electricity conveyed by distribution or transmission systems. The interests of these consumers are their interests taken as a whole, including their interests in the reduction of greenhouse gases, and in the security of the supply of gas and electricity to them. GEMA is constituted of individuals who are appointed by the Secretary of State for specified terms of not less than five years.

GEMA delegates its functions to Ofgem and provides it with strategic direction and oversight. Ofgem is also a non-ministerial government department and an independent national regulatory authority recognised by EU directives. Ofgem states that its principal objective is to protect the interests of existing and future electricity and gas consumers. Ofgem E-Serve, which introduces itself as the 'delivery arm of Ofgem', administers environmental schemes and consumer and social programmes on behalf of the government, including schemes related to renewable energy such as the FIT scheme, CfDs, RO, the CCL and the OLR scheme (see Section III.i for more details).

The Environment Agency is responsible for protecting and improving the environment, as well as promoting sustainable development. The role of the Environment Agency regarding electricity is limited to matters related to pollution and therefore mainly relates to conventional generation and nuclear energy.

The Energy Act (together with secondary legislation) implements key aspects of electricity market reform and is a policy initiative pioneered by the UK government to mobilise £110 billion of capital investment required by 2020 to ensure a reliable and diverse supply of low-carbon electricity. This is the applicable regulatory framework for the developing, financing, operating and selling of power and environmental attributes from renewable projects, and the regulation of CfDs.

The RO scheme has created a market for the sale of environmental attributes. Through the RO scheme, the government places an annual obligation on licensed electricity suppliers to source a proportion of the electricity they supply to customers from renewable energy sources. These suppliers are required to meet their individual obligation target by purchasing Renewable Obligation Certificates (ROCs) from renewable generators directly, from the ROCs market or by paying a set amount to government by way of a penalty. Through this mechanism, ROCs have a monetary value (the buyout price for the 2019–2020 ROCs is

£48.78 per ROC) and generators have been able to sell (among other things) the electricity generated by their renewable generating stations (and associated ROCs) to licensed electricity suppliers.

A generation licence is required for the sale of electricity and this stipulates compliance with the relevant industry codes. In particular, all licence holders (for example, transmission, generation, supply and distribution) must be registered within the Balancing and Settlement Code. Certain environmental, health and safety, and electricity quality measures must also be in place for the construction and operation of systems that generate and supply electricity (Electricity, Safety, Quality and Continuity Regulations 2002 (as amended)); these will depend on the relevant renewable project in question.

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

i Project finance transaction structures

As with all energy and infrastructure projects, the financing structure for renewable energy projects depends on the nature of the client and the type of project. In a straightforward project, for example, the funding may come from a combination of equity investment or debt finance (including in some cases, mezzanine finance), through a single lender or multiple lenders and on a non- or limited-recourse basis. Senior lenders can include commercial banks familiar with project financings, export credit agencies, multilaterals such as the European Investment Bank or the International Finance Corporation.

Private equity funds may be willing to take construction risk and provide additional funding ranking senior to pure equity, which can be contributed at a senior or mezzanine level (depending on the particular project).

Where there are unproven technologies or other uncommon risks that traditional financiers are not willing to take, or where the use of traditional project financing would prove too expensive, certain other sources of funding have been available, such as the EU NER300 fund, direct grants from the government and, in Scotland, the Renewable Energy Investment Fund administered by the Scottish Investment Bank.

Once the 'risky' construction phase period has ended and projects are operational, further financing structures become available in addition to those described above. Examples of these are refinancing of construction-phase bank financings by way of capital market instruments and institutional investors such as pension and insurance funds, who do not customarily have an appetite for construction risk, but who look favourably at long-term debt financings with proven and stable cash flows.

In domestic UK project financings, the intention of the parties (and the usual requirement of all types of lenders) is to create security over all, or substantially all, of a project company's assets. Project finance borrowing vehicles are normally special purpose vehicles (SPVs) with no pre-existing businesses, rights or liabilities beyond those associated with the project. Security is normally granted by way of a general security agreement, such as a debenture, which covers all the SPV's rights and assets (both pre-existing and after-acquired) or (less commonly) by way of separate security agreements for each type of asset. Lenders will look to achieve 'going concern' security on a UK-based project or asset. This is aimed at putting them in a position of default, stepping in if necessary and operating (or selling) the relevant asset as a going concern. Basic legal security is normally insufficient to achieve this type of outcome; conventional legal security is often supplemented by bespoke contractual arrangements providing lenders with specific notice, 'cure' and 'step-in' rights. Where (as

is very often the case) the viability of a project as a going concern is dependent upon the continuing availability to an operator or owner of permits and licences, special attention will need to be paid to the consequences of default in the wider sense – by way of example, breach of licence conditions or change of control can result in permits and licences being breached or becoming terminable. Certain types of licences and permits are, in effect, personal to the initial licence holder; contractual rights can be expressed to be non-assignable in the absence of consents. A careful analysis of the regulatory and practical conditions applicable to the application for, and maintenance of, permits, licences and key contracts is necessary and will differ on a case-by-case basis.

The main types of securities under English law are mortgages (equitable and legal), charges (fixed and floating), assignments (broadly equivalent to charges), pledges and liens. Mortgages, charges and assignments are the most frequently used forms of security. Assignments may be legal or equitable; the process for enforcement of the two types of security differs. A debenture will include a range of mortgages, charges and assignments depending on the nature of the security assets. Debentures can create legal mortgages and fixed and floating charges over all the borrower's assets, if agreed, and as set out in the debenture. The debenture is executed as a deed.

ii Distributed and residential renewable energy

Underpinned by general environmental concerns, technological innovation and government policy, the growth of on-site distributed generation projects has been noticeable in recent years. In particular, an uptake in residential use has been seen, with very small-scale projects operated and maintained by residential end users evident across the country. Similarly, businesses and public sector institutions continue to instal their own generation projects, whether that be high-street stores, office blocks or public-sector services buildings, such as hospitals.

The types of technologies seen in the residential sector include solar photovoltaic panels, small wind turbines, natural-gas-fired fuel cells and emergency backup generators. In the commercial and industrial sectors, the same technologies exist in addition to hydropower, biomass combustion, municipal solid waste incineration, natural gas or biomass-fuelled fuel cells and reciprocating combustion engines. The uses of such distribution generation projects and the ownership and offtake structure depend largely on the user and their needs. For example, if a hospital has a system, it will seek high reliability and thus high quality, perhaps at the expense of cost. On the flip side, industrial plants may prioritise a low cost system over other factors.

Recently, microgrids have emerged as part of a number of solutions for the UK's transition from a conventional energy system to one fit for the 21st century and beyond, responsive to changing needs and desires, namely the pursuit of low-cost, efficient energy that has minimal environmental impact. The UK government in particular has encouraged microgrids because, as they work locally, they can be disconnected from the national grid to operate independently where necessary. The importance of their independence cannot be understated, namely because, in the event of a disturbance, microgrids can be isolated to minimise greater disruption. For that reason they are an attractive option for small communities. An example of a scheme is the Flexible Plug and Play initiative, introduced in 2012. This three-year programme delivered cheaper and faster distributed generation connections, as well as enabling such distribution schemes to become active, where previously they were thought to be unfeasible.

The nature of distributed generation is that it allows for self-consumption, offering significant consumer benefits in terms of economics. However, it is particularly important in this context that consumers fully understand the legal backdrop of any electricity generated, especially if they intend to sell the excess electricity generated. Not only is compliance with the applicable regulations imperative, but there are a number of agreements and contracts that need to be put in place by the distributor, meaning in the residential sector legal and professional advice must be sought, adding to expense. In terms of property rights, it may be advisable for those involved to ensure they are sufficiently protected by obtaining options for leases and options for easements. In addition, the effect of Brexit is unknown, and this uncertainty has a particular impact on distributed generation, an area partially regulated by the European Union.

In 2018, there was 3.3GW of storage capacity operational in the UK, and planning consent was obtained for a further 5.4GW (including 4.8GW of battery storage). These storage projects consist in the majority of lithium-ion battery, lead-acid battery, open-loop pumped hydro storage, closed-loop pumped hydro storage and modular compressed storage. Electricity storage is treated as a form of electricity generation and, as such, the applicable legal framework to electricity storage is currently the same as that applicable to electricity generation.

The classification of electricity storage as generation (and therefore the application of the legal framework applicable to generators) has been seen to be a significant hurdle to the development of energy storage projects in the UK; this has been acknowledged by Ofgem, which has committed to work together with the government to provide greater regulatory clarity. Some of the key concerns are that certain licensed operators, such as distribution licence holders, are restricted from holding a generation licence and therefore from operating electricity storage. The requirement for electricity storage operators to hold a generation licence is administratively burdensome for the operators, as it imposes on them all the regulations and codes that apply to electricity generators. In addition to the above, the current regulatory regime also treats electricity storage operators as consumers as well as electricity generators, resulting in electricity storage operators being charged double for using the electricity grid – once as a consumer when electricity is taken from the grid for storage and again as a generator when exporting electricity to the grid (they also potentially face double-charging of various government levies to fund low-carbon incentive schemes where the levies are themselves added to electricity costs). In January 2019, BEIS launched a consultation to solicit views on proposed changes to the treatment of energy storage under the planning system.

iii Non-project finance development

In the UK, the divide between conventional project finance and the bond and leveraged finance markets continues to narrow. The market saw a continuation of diversification of both sources and types of project-related debt. As with the project bonds market, the trend comes in part from the United States; 2018 saw a number of infrastructure and energy sponsors experimenting with Term Loan B structures – sometimes as refinancing tools, sometimes to sit alongside conventional financings or less conventional financings – for example, inventory and receivables financings.

There are no legal requirements that apply exclusively to project companies seeking to issue bonds or similar capital markets instruments. Any project company seeking to issue debt instruments (securities) on the London Stock Exchange (LSE) must comply with the Listing Rules of the UK Listing Authority (UKLA) (the Listing Rules). The UKLA, a division

of the Financial Conduct Authority, is the body responsible for regulating all securities listed on the LSE. The Listing Rules contain (1) the rules and regulations for listing debt securities, and (2) the continuing obligations that apply to issuers and bondholders for the duration of the listing. The Listing Rules cover principles ranging from corporate governance and executive remuneration to accounting standards and full disclosure of information to prospective investors. Debt securities admitted to the Main Market of the LSE must be listed in accordance with Chapters 2 and 17 of the Listing Rules. Debt securities admitted to the Professional Securities Market must be listed in accordance with Chapter 4. All debt securities admitted to trading must comply with the LSE's Admission and Disclosure Standards and the relevant Disclosure and Transparency Rules.

Rules may differ according to the issuer's market sector. Rules may also differ according to the issuer's investor base. For example, an issuer will be subject to more stringent obligations if marketing its securities to retail investors as opposed to solely professional investors.

V RENEWABLE ENERGY MANUFACTURING

As the EU is a customs union, UK companies can buy most goods from other member countries without restrictions – although VAT and excise duty will normally still apply. If a UK company imports from outside the EU, it may have to comply with import licensing requirements and with common customs tariffs that apply across the EU. Apart from the general restrictions concerning materials that are deleterious to health and safety and the environment, there are no legal restrictions or controls that apply exclusively to importing construction equipment. It is not yet known whether the UK will remain part of the EU Customs Union following the UK's exit from the EU on 31 October 2019.

VI CONCLUSIONS AND OUTLOOK

As the UK emerges from the economic slowdown and moves into a period of economic growth, there is considerable demand for upgrading existing infrastructure or investing in new, greenfield projects. The Conservative government expects that over the next decade to 2027, total public and private investment in the sector is expected to reach around £600 billion. Already, public and private infrastructure investment has gradually increased over the past three decades (since 2010, 4,500 infrastructure projects have been delivered). The two largest sectors, energy (which boasts investment of £191,338.5 million from 2017/2018 to 2020/2021) and transport (£135,276.9 million from 2017/2018 to 2020/2021), account for 70 per cent of the infrastructure pipeline's total value.

The UK government's commitments under the Paris Climate Agreement, together with its obligations under the 2009 and 2018 Renewable Energy Directives, coupled in turn with the political and legislative uncertainty resulting from the UK's referendum vote to exit the EU, are likely to be the biggest drivers of change in the renewables energy market in the short and medium term.

Chapter 17

UNITED STATES

Karen B Wong and Henry T Scott[1]

I INTRODUCTION

The renewable energy industry in the United States has adjusted to a rapidly changing political landscape. Long-standing state and federal policy drivers, emerging and improved technology, and momentum conducive to the development of renewables have resulted in the US renewable energy industry faring better than many expected over the past year. This chapter contextualises these developing policies and trends by providing a brief and focused overview of renewable energy from the US perspective. First, this chapter summarises major developments over the past year in the US renewable energy industry. Second, this chapter discusses the policy and regulatory framework underlying the development of renewable energy in the United States, project development through common sources of debt financing, and federal renewable energy tax credits and the associated tax equity project finance structures. This chapter also discusses distributed renewable energy and various forms of non-project finance renewable development, such as utility-owned projects and non-profit projects. Lastly, this chapter discusses trends and changes within renewable energy manufacturing, with a focus on recent policies affecting domestic solar manufacturing.

II THE YEAR IN REVIEW

Despite political uncertainty and gridlock in Washington, renewable energy in the United States has remained in good health. Renewable generation surged from 711TWh in 2017 to 747TWh in 2018;[2] 7,588MW of wind energy capacity and 10.6GW of solar energy capacity (including approximately 6.2GW of utility-scale solar installations) were installed in 2018,[3] while approximately 17,213MW of wind capacity were under construction at the

1 Karen B Wong and Henry T Scott are partners at Milbank LLP.

2 See Bloomberg Finance LP and the Business Council for Sustainable Energy, '2019 Sustainable Energy in America Factbook', 22 (2019).

3 See American Wind Energy Association, 'U.S. Wind Industry Fourth Quarter 2018 Market Report: Public Version', available at the American Wind Energy Association website, https://www.awea.org/resources/publications-and-reports/market-reports/2018-u-s-wind-industry-market-reports/4q2018_public. See the Solar Energy Industries Association website: https://www.seia.org/research-resources/solar-market-insight-report-2018-year-review.

end of the first quarter of 2019, and more than 12GW of solar capacity are expected to be installed in 2019.[4] Additionally, hydroelectric capacity is expected to grow from 101GW to approximately 150GW by 2050, thanks not only to new power plants, but also to upgrades to existing plants and increased pumped storage hydropower capacity.[5]

This growth has been propelled by extended federal incentives, advances in green technology and congenial state policies. As at February 2019, 29 states, three territories and the District of Columbia have enacted mandatory Renewable Portfolio Standards (RPS), while eight other states and Guam have voluntary renewable energy standards or targets.[6] Hawaii was the first state to adopt an RPS that mandates that its electric utility companies acquire 100 per cent of their net electricity sales from renewable energy sources by 31 December 2045[7] and Vermont currently boasts an RPS that mandates 90 per cent of net electricity sales from renewable energy sources by 2050.[8] California, which has one of the nation's most ambitious RPS programmes, requires utilities to derive 33 per cent of their energy from renewable sources by the end of 2020, 44 per cent by the end of 2024, 52 per cent by the end of 2027 and 60 per cent by the end of 2030 (with the ultimate goal of obtaining 100 per cent of the retail sales of electricity to end-use customers and the electricity to serve all state agencies from renewable energy resources and zero-carbon resources by the end of 2045).[9] As a result of the enactment of Senate Bill 100 by the California legislature in 2018, the state's RPS requires that 60 per cent of total retail sales of electricity come from eligible renewable energy resources and zero-carbon resources by the end of 2030 and 100 per cent by the end of 2045.[10] Although the larger California investor-owned utilities have enough renewable energy capacity under contract to meet the 2020 threshold, and one already has enough contracted capacity to reach the 2027 target,[11] the higher RPS requirement is likely to result in a need for additional renewable energy generation. Solar mandates on new buildings, such as the California Energy Commission's decision to require solar photovoltaic on all new homes commencing in 2020, will propel additional distributed solar development.[12] In addition, the January 2019 bankruptcy filing by California's largest utility, Pacific Gas &

4 See American Wind Energy Association, 'U.S. Wind Industry First Quarter 2019 Market Report: Public Version', available at the American Wind Energy Association website, https://www.awea.org/resources/publications-and-reports/market-reports/2019-u-s-wind-industry-market-reports/q12019_marketreport. See the Solar Energy Industries Association website: https://www.seia.org/research-resources/solar-market-insight-report-2018-year-review.

5 See Hydropower Vision, A New Chapter for America's 1st Renewable Electricity Source, prepared by the US Department of Energy Wind and Water Power Technologies Office, available at the US Department of Energy website: https://www.energy.gov/sites/prod/files/2018/02/f49/Hydropower-Vision-021518.pdf.

6 See State Renewable Portfolio Standards and Goals, prepared by the National Conference of State Legislatures, available at: http://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx#gu.

7 See US Energy Information Administration, Hawaii and Vermont Set High Renewable Portfolio Standard Targets (29 June 2015), available at: https://www.eia.gov/todayinenergy/detail.php?id=21852.

8 See Vermont Department of Public Service, State Renewable Energy Goals, available at: http://publicservice.vermont.gov/renewable_energy/state_goals.

9 See the California Public Utilities Commission website: www.cpuc.ca.gov/rps/.

10 See https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100.

11 See the California Public Utilities Commission website: www.cpuc.ca.gov/RPS_Homepage/.

12 See Building Energy Efficiency Standards for Residential and Nonresidential Buildings, California Code of Regulations, Title 24, Parts 1 and 6, available at: https://ww2.energy.ca.gov/2018publications/CEC-400-2018-020/CEC-400-2018-020-CMF.pdf.

Electric Company (PG&E),[13] may result in the rejection of power purchase agreements with renewable energy generators with above-market prices. The PG&E bankruptcy underscores a number of challenges traditional utilities are facing, including the erosion of customer base due to the emergence of new competitors such as community choice aggregators, and potential liabilities arising in connection with climate-induced natural disasters, such as the recent California wildfires.

Renewable energy projects in the United States continued to rely on the federal production tax credit (PTC) and investment tax credit (ITC) in 2018. Under the Protecting Americans from Tax Hikes Act of 2015, the PTC was extended to 2020 for eligible wind projects and the ITC was extended to 2022 for eligible solar projects.[14] In 2017, there was approximately US$6 billion of tax equity investment in wind and US$4 billion of tax equity investment in solar.[15] While there was no direct change to either the PTC or the ITC under the Trump administration's tax plan that passed on 22 December 2017, it was initially feared that the reduction in the minimum corporate tax rate from 35 per cent to 21 per cent, the new base erosion and anti-abuse tax, and the ability to elect 100 per cent bonus depreciation under the new tax plan would have a significant negative impact on projects relying on these tax credits. This proved not to be the case, as the combined tax equity investments in solar and wind projects increased to US$12 billion for 2018, with the majority still focused in the wind sector as the volume of solar tax equity investments in 2018 declined from the previous year.

Similarly, buoyed by state mandates and favourable IRS rulings regarding the applicability of the ITC, the advent of large-scale energy storage could fundamentally change the US renewable energy industry. Storage offers valuable flexibility and resilience; it can be used to throttle demand, alleviate transmission congestion and increase system reliability.[16] Importantly, it plugs gaps in reliability by making renewable energy available at any hour of the day, fixing the timing imbalance between renewable energy generation and use (referred to colloquially as the 'duck curve').[17] On 30 May 2019, Mitsubishi Hitachi Power Systems and Magnum Development announced the Advanced Clean Energy Storage initiative, a project to develop the world's largest renewable energy storage project in Utah with the goal of providing electricity with zero-carbon emissions to the Western United States.[18]

Since the successful completion and commercial operation of the 30MW Block Island Wind Farm Project, the first US offshore wind project, in 2016, there has been tremendous interest in the US offshore wind market, which according to the American Wind Energy

13 See the US Bankruptcy Court for the Northern District of California website: http://www.canb.uscourts.gov/case-info/pge-corporation-and-pacific-gas-andelectric-company.

14 Pub. L. No. 114-113, Div. Q, 129 Stat. 2242 (2015).

15 See Emma F. Merchant, 'Tax Equity Investors Break Their Silence on Congressional Tax Bill', Greentech Media, 12 January 2018, available at: https://www.greentechmedia.com/articles/read/tax-equity-investors-break-their-silence-on-tax-bill#gs.AFrcbP0.

16 See Paolo D'Aprile et al., 'The New Economics of Energy Storage', McKinsey & Company, August 2016, available at: https://www.mckinsey.com/business-functions/sustainability-and-resource-productivity/our-insights/the-new-economics-of-energy-storage.

17 See Harnessing the Potential of Energy Storage, prepared by Edison Electric Institute, May 2017, available at: http://www.eei.org/issuesandpolicy/generation/Documents/EEI_HarnessingStorage_Final.pdf.

18 See 'World's Largest Renewable Energy Storage Project Announced in Utah', 30 May 2019, available at: https://www.apnews.com/Business%20Wire/4cd173038f674c1793a55180fbe3ab7b.

Association, represents a potential for more than 2,000GW of energy.[19] The state policies adopted by Maryland, Massachusetts, New Jersey, New York, and Rhode Island to promote offshore wind development, which include the requirement for power companies to purchase energy from offshore wind projects, has provided the stability needed to spurn the development of an American supply chain for the industry and could lead to the installation of 22,000MW of offshore wind projects by 2030 according to the Department of Energy.[20] The first of the large utility-scale offshore wind projects expected to commence construction in 2019 is the 800MW Vineyard Wind project jointly being developed by Iberdrola's affiliate Avangrid Inc, and Copenhagen Infrastructure Partners.[21] The Bureau of Ocean Energy Management notes that there are 15 active leases for offshore wind projects and others may be forthcoming.[22]

The private sector's march towards clean power is emblematic of current trends. An ever growing list of the world's most influential companies, including institutions such as Bank of America, large retailer Walmart and Silicon Valley giants Apple and Google, have committed to sourcing 100 per cent renewable power.[23] Indeed, large companies are driving demand for renewable energy: American corporations signed a record 6.4GW of power purchase agreements in 2018, with Facebook alone signing 22 renewable energy deals, the highest number of deals for 2018.[24]

III THE POLICY AND REGLATORY FRAMEWORK

i The policy background

Obama-era regulations from the US Environmental Protection Agency (EPA) aimed at limiting greenhouse gas emissions from existing fossil fuel-fired electric generating units have potential to spur substantial growth in renewables, but recent reversals in federal government policy are expected to dilute or eliminate the impact of those rules. The EPA rules set state-specific goals for reducing emissions from the power sector;[25] the wind and solar sectors are poised to help states meet the proposed compliance plans.[26] The final rules were released

19 See AWEA website, https://www.awea.org/policy-and-issues/u-s-offshore-wind.

20 id.

21 See https://www.vineyardwind.com/the-project.

22 See https://www.boem.gov/Lease-and-Grant-Information.

23 See the RE100 website: http://there100.org/companies; Shayle Kaan, 'The Private Sector May Lead the Charge Against Climate Change During the Trump Administration', Greentech Media, 15 December 2016, available at: https://www.greentechmedia.com/articles/read/the-private-sector-may-lead-the-charge-against-climate-change#gs.5djNUc4 and https://www.apple.com/newsroom/2018/04/apple-now-globally-powered-by-100-percent-renewable-energy/.

24 See Christian Roselund, 'Corporate solar procurement knocks it out of the park in 2018', pv magazine USA, 18 December 2018, available at https://pv-magazine-usa.com/2018/12/18/corporate-solar-procurement-knocks-it-out-of-the-park-in-2018/. See Emma Foehringer Merchant, 'The Year of the Corporate PPA', Greentech Media, 21 December 2018, available at https://www.greentechmedia.com/articles/read/the-year-of-the-corporate-ppa#gs.f6je78.

25 See the US Environmental Protection Agency website: https://www.epa.gov/cleanpowerplan/clean-power-plan-existing-power-plants.

26 See 'A Handbook for States: Incorporating Renewable Energy into State Compliance Plans for EPA's Clean Power Plan', by the American Wind Energy Association and the Solar Energy Industries Association, available at the Solar Energy Industries Association website: https://www.seia.org/research-resources/handbook-states-incorporating-renewable-energy-state-compliance-plans-epas-clean.

in August 2015 (the Clean Power Plan) but faced immediate legal challenges from a large number of affected states, state agencies, utility companies and energy industry trade groups. After an emergency stay was granted by the US Supreme Court, the US Court of Appeals for the DC Circuit heard oral arguments on the merits of the case in September 2016. In March 2017, President Trump issued an executive order setting out his administration's policy to promote energy independence and economic growth, and ordered the EPA to review the Clean Power Plan for consistency with the new policy. Subsequently, at the EPA's request, the US Court of Appeals held the case in abeyance and last extended that status on 5 April 2019 for an additional 60 days.[27] On 16 October 2017, the EPA proposed the repeal of the Clean Power Plan[28] and published the proposed repeal rule, known as the Affordable Clean Energy (ACE) rule, on 31 August 2018.[29] The EPA's final repeal rule was expected in June 2019.[30]

ii The regulatory framework

Renewable energy regulation in the United States is centred on the regulation of electric generation and transmission. The applicable regulatory areas for electricity from renewable sources consist of a number of distinct subjects, including: (1) the 'siting' of generation projects – regulation by state authorities of the energy facility's initial construction and operation; (2) the interconnection of generation projects to an electric grid; (3) the rates at which generators sell electric output; (4) the financial, corporate and organisational regulation of generation companies; and (5) the regulation of electrical reliability.

Regulation of electric generation is the responsibility of both state and federal governments. First, electricity generators must obtain certification from state entities to construct and operate generation facilitates. Traditionally, states exercise siting regulation through state laws that require a generation project to obtain a certificate of public convenience and necessity (CPCN), which allows the certificate holder to exercise a right of eminent domain to obtain property necessary for the energy project. More recently, in most (but not all) states, laws have been enacted relaxing the need for a CPCN for some or all generator facilities.

Second, renewable energy is regulated when it is transmitted to an electric grid. Here, the generation project sells electricity to a service provider, typically a local utility or an independent system operator. While the service provider is the entity that must comply with interconnection regulations, the generation project is still affected. The Federal Energy Regulatory Commission (FERC) has asserted jurisdiction over interconnection to the high-voltage transmission grids (typically 100kV and above, but sometimes lower voltages too) where the grids allow power flows across state lines. State regulatory authorities control the interconnection process in Hawaii, Alaska and Puerto Rico, and in the Electric Reliability Council of Texas, which occupies most of central Texas and is not synchronously

27 See the Environmental Defense Fund website: https://www.edf.org/sites/default/files/content/2019.04.05%20Order%20Continuing%20Abeyance.pdf.

28 82 FR 48035 (16 October 2017).

29 83 FR 44746 (31 August 2018).

30 See Lisa Friedman, 'E.P.A. Plans to Get Thousands of Pollution Deaths Off the Books by Changing Its Math', NY Times, 20 May 2019, available at: https://www.nytimes.com/2019/05/20/climate/epa-air-pollution-deaths.html. See also https://www.powermag.com/epa-will-issue-final-carbon-rules-for-power-plants-in-june/?pagenum=1.

interconnected with the rest of the United States. Service providers in FERC jurisdiction offer interconnection agreements to generation projects, to which the parties file the agreements with FERC.

Third, the regulation of electric utility rates is the heart of the regulatory framework. FERC has jurisdiction over wholesale rates for electricity in interstate commerce; it controls the prices at which generating facilities sell power to utilities 'for resale' to customers in any part of the United States where power flows across state lines. FERC has two different methods for determining the rates at which wholesale electricity can be bought and sold: market-based rates and cost-based rates. Cost-based rate regulation is the older system, typically applied to traditional vertically integrated utilities with captive customers and to independent transmission companies. Here, rates are based on accounting costs that comply with FERC's Uniform System of Accounts, including an allowed rate of return on invested capital. Conversely, market-based rate regulation is used by FERC for companies that do not have market power or that have mitigated their ability to exercise market power. Once a generator obtains market-based rate (MBR) authority from FERC under Section 205 of the Federal Power Act, the generator may sell wholesale electric energy, capacity and ancillary services (as specified in the MBR tariff) at market-based rates.

Fourth, FERC's corporate regulation of utility mergers and consolidations, and leases and sales (or other dispositions) of jurisdictional facilities under Section 203 of the Federal Power Act is a significant aspect of electric regulation. FERC has to approve any transaction in which the ownership or control of jurisdictional facilities will change.[31] In deciding whether or not to approve a change of control, FERC considers four factors: the effect of the proposed transaction on competition, the effect on rates, the effect on regulation, and the possibility of any cross-subsidies between cost-based and market-based utilities.[32]

Finally, FERC has imposed electrical reliability standards, pursuant to which it reviews generation facilities' reliability, imposing fines and requiring remedial actions for violations.

This regulatory framework underlies the broader pursuit of renewable energy development in the United States. The National Renewable Energy Laboratory notes that the aim of renewable energy regulation is fourfold: facilitating new renewable energy generation, ensuring adequate grid infrastructure, ensuring a secure short-term electricity supply and ensuring long-term electricity security.[33] These goals can only be understood and achieved through a regulatory framework that works in conjunction with national and foreign policy, tariffs and project development of renewable energy.

31 This includes sales of equity interests of 10 per cent or more, directly or indirectly, in any public utility. It should be noted that 'jurisdictional facilities' include both physical facilities such as transmission or interconnection facilities, and 'paper facilities' such as contracts, rate schedules or a tariff (including a market-based rate tariff) that have been accepted for filing under Federal Power Act Section 205.

32 This last factor was added by the US Congress pursuant to the Energy Policy Act of 2005.

33 Mackay Miller and Sadie Cox, National Renewable Energy Laboratory, *Overview of Variable Renewable Energy Regulatory Issues* (2014), available at: https://www.nrel.gov/docs/fy14osti/61350.pdf.

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

i Project finance transaction structures

Consistent with project financing transactions worldwide, the use of a special purpose vehicle (SPV), known as the 'project company', is commonly used in US project finance transactions. Moreover, many project sponsors will develop multiple projects using different single-purpose project companies with separate financing transactions for each project.

Limited liability companies (LLCs) are the most common type of business organisation used for project companies because an LLC offers limited liability protection similar to that of a corporation but can be treated as a disregarded or flow-through entity for US federal income tax purposes. The flow-through nature of an LLC enables gains, losses and depreciation from a project to be passed to the holder of an ownership interest in an LLC, referred to as a 'member', and avoids the double taxation that would result when using a traditional corporation. This is particularly advantageous in the renewable energy sector when the sponsor of a renewable energy project cannot efficiently or fully utilise the tax benefits from PTCs or ITCs. By utilising an LLC entity, parties can structure the management and ownership of a project company to facilitate a tax equity transaction, in which management rights can be vested in the strategic developer but ownership can be shifted to passive tax equity investors, who can avail themselves of the PTCs to be generated by the project or the ITCs associated with the project. In addition, parties can agree on adjustments to the allocations of gains and losses as necessary to address different risk allocation factors.

Generally, the bank market and the private placement market provide the primary sources of debt financing for US renewable energy projects. Banks typically provide project companies with construction and term loan facilities for the development, construction and operation of a renewable energy project, as well as letter of credit facilities to enable project companies to satisfy certain credit support obligations required under project contracts. In addition, banks often offer other specialised debt facilities, such as equipment supply loans to facilitate the purchase of wind turbine generators or solar equipment prior to a project's completed development and final permitting. Often construction and term loan facilities will refinance these equipment supply loans. Sometimes banks will provide equity bridge loans to support the project's equity contribution commitments. A unique bank product that has developed in the renewable energy industry is a 'back-leveraged term loan', which is essentially a term loan made at a level above the project company and is secured by the membership interests owned by a project developer in the parent of a project company (and not the direct assets of a project company). Back-leveraged term loans have evolved to minimise interparty negotiations with tax equity investors when a 'partnership-flip' structure has been implemented. Banks also offer back-leveraged term loans to project holding companies, which include the partnership-flip structure discussed below.

Institutional investors that participate in the private placement transaction also offer a source of debt financing with fixed interest rates. Here, projects are financed through the issuances of bonds in capital markets, which are offered under Section 4(2) or Rule 144A of the Securities Act of 1933. Private placements under Section 4(2) are typically made only to accredited investors, such as a pension fund or an insurance company. Offerings in the bond market under Rule 144A are made only to qualified institutional buyers, which are sophisticated purchasers with over US$100 million of qualifying assets. While Section 4(2) private placements are usually made to a very small number of accredited investors through an administrative agent mixed with bank transactions, Rule 144A offerings are usually sold to a large number of investors administrated by a trustee under an indenture on behalf of

qualified institutional buyers. Rule 144A transactions typically require less oversight and consent requirements than traditional bank transaction and Section 4(2) placements and offer a less onerous covenant package, given that waivers and modifications are harder to obtain when the transaction has been widely syndicated.

PTCs and ITCs have also changed the landscape of renewable energy project finance structures to the extent that a tax equity investor must own the renewable energy project to avail itself of these tax credits and other tax benefits. The partnership-flip transaction is a popular vehicle for project companies to implement to monetise their PTCs and ITCs and other tax benefits. In this structure, a tax equity investor enters into an equity contribution agreement or a membership interest purchase agreement prior to or during the construction phase of a project, pursuant to which the tax equity investor commits to contribute capital contributions or to purchase a membership interest in the project company (or parent) at the time (or immediately before in the case of a project monetising the ITCs) that the project is placed in service. The proceeds from the tax equity investment are applied to repay the construction debt. There are variations to this structure, known as the pay-as-you-go, or PAYGO, structure, in which the tax equity investor contributes less than 100 per cent of the equity provided under a traditional partnership-flip structure and agrees to make ongoing contributions during the operational period of the project as PTCs are generated.

The single investor lease or a leveraged lease transaction is an alternative structure used to monetise the ITCs associated with a renewable energy project. In a lease structure, a tax equity investor acquires the project and its tax attributes, and then leases the asset back to the developer, who operates the project and pays rent to the tax equity investor–lessor.

ii Distributed and residential renewable energy

Distributed generation covers technologies that generate electricity at or near where it will be used. In the United States, distributed energy is comprised of microgrids – such as structures on residential homes, industrial facilities or college campuses – that feed into larger electrical grids maintained by utility companies.[34] Distributed generation capacity, which is 90 per cent sourced from solar panels but also relies on wind, fuel cells and heat power, amounts to nearly one sixth of the nation's capacity from existing centralised power plants.[35] While some distributed generation systems are isolated from any centralised electrical grid, almost all distributed generation systems allow for net metering – connecting customers to a centralised grid from which they can purchase power when they are under-producing and to which they can sell any excess power generated.[36] As at April 2019, 48 states and the District of Columbia compensated customers for distributed energy, although rates and prices varied greatly.[37]

34 See Environmental Protection Agency (EPA), *Distributed Generation Electricity and Its Environmental Impacts*, https://www.epa.gov/energy/distributed-generation-electricity-and-its-environmental-impacts#ref1.

35 See EPA, *Distributed Generation Electricity and Its Environmental Impacts*, https://www.epa.gov/energy/distributed-generation-electricity-and-its-environmental-impacts#ref1. Distributed generation estimated at about 200 gigawatts in a 2007 study by the Federal Energy Regulatory Commission (FERC). The total nameplate capacity of US centralised power plants was more than 1,100 gigawatts as of 2012, according to the US Energy Information Administration.

36 See Richard Revesz and Burcin Unel, *Managing the Future of the Electricity Grid: Distributed Generation and Net Metering*, 41 Harv. Envtl. L. Rev. 43 (2017).

37 See Database of State Incentives for Renewables and Efficiency, Net Metering, 2019, available at https://s3.amazonaws.com/ncsolarcen-prod/wp-content/uploads/2019/07/DSIRE_Net_Metering_April2019.pdf.

The emergence of significant distributed generation installations in the United States has sparked policy debates over the price at which customers are compensated for sales of energy to utility companies.[38] Some states use set scales to compensate customers at the same rates they pay for consumption of energy, others impose lower rates for energy produced versus consumed, and others still impose special 'standby' charges for the right to sell energy.[39] For states imposing lower rates for energy produced by distributed generation installations, the lower prices are justified by utility companies as an 'avoided cost' – the costs the utility company would have incurred in producing the energy itself.[40] While there is no federal policy on distributed energy pricing, there is proposed US Senate legislation, backed by environmentalists and renewable energy supporters, that would regulate and standardise rates and prevent unjustified utility charges.[41] Likewise, utility companies have largely opposed distributed energy because of concerns over lost profits, resulting in many utilities lobbying states for decreased compensation. Regardless, standardised regulation will be necessary to support the continued growth of distributed energy.

iii Non-project finance development

While the vast majority of renewable energy projects are developed through project finance structures sponsored by private SPVs, utility-sponsored projects and non-profit sponsored projects have grown in popularity in recent years.

Utilities have sponsored community solar projects funded through upfront or ongoing payments directly from community ratepayers.[42] The customer buys, from the utility or a third-party owner, the rights to the benefits of the solar energy produced by the community project. Utility-sponsored programmes can make solar power more accessible for residents – as opposed to distributed generation or residential solar – because it requires less purchase power per resident and allows customers to purchase solar electricity in monthly increments. Two examples of such projects are the Sacramento Municipal Utility District's Solar Shares[43] and Tucson Electric Power's Bright Tucson[44] programmes. Electric co-ops, municipal utilities and public utility districts cannot benefit from renewable energy tax incentives for their community solar projects, since these entities do not pay federal taxes; however, they can take advantage of Clean Renewable Energy Bonds, which are not available to private entities. Since 2008, private and investor-owned utilities have qualified for the PTC[45] or the 30 per cent ITC[46] by meeting certain requirements.

Non-profit organisations have also created successful renewable energy projects financed through tax-deductible community donations. These donations are used to cover project construction costs, in which the donors receive tax deductions – if the donors receive

38 See Richard Revesz and Burcin Unel, *Managing the Future of the Electricity Grid: Distributed Generation and Net Metering*, 41 Harv. Envtl. L. Rev. 46 (2017).

39 id., at 47.

40 id.

41 id., at 48.

42 See US Department of Energy, *A Guide to Community Solar: Utility, Private, and Non-Profit Project Development* (2012) https://www.nrel.gov/docs/fy12osti/54570.pdf.

43 See Sacramento Municipal Utility District, *Power Sources*, https://www.smud.org/en/Corporate/Environmental-Leadership/Power-Sources.

44 See Tucson Electric Power, *Bright Tucson Community Solar*, https://www.tep.com/community-solar/.

45 Section 45 of the Internal Revenue Code of 1986, as amended.

46 Section 48 of the Internal Revenue Code of 1986, as amended.

a return benefit, such as electrical savings, their donation would constitute a quid pro quo contribution and their donation would not be tax-deductible. The generated energy is sent directly to the non-profit, such as a school or church, which is connected through a distributed generation model to a utility. The non-profit uses the electricity directly or receives compensation for over-production. While the non-profit is not eligible for federal commercial ITCs, it is eligible for other grants and funding not available to public utilities or private entities. The non-profit model has been successful throughout the country for small-scale projects, such as the community solar project in Bainbridge Island, Washington, in which 26 community organisations and individuals donated to the cost of construction of solar panels that support the local school's energy needs.

Feed-in tariffs have also been introduced, albeit on a relatively limited basis, in the United States.[47] These policies provide guaranteed payments to renewable energy producers (including individual homeowners) for the actual amount of energy they produce. This makes renewable energy investments far more attractive to homeowners and other investors, as feed-in tariffs can be used to guarantee a reasonable rate of return on the levelised costs of energy for a project.[48] Further, data from Europe (where feed-in tariffs are more widely implemented) tends to show that feed-in tariffs are more cost-effective per kWh than upfront rebates and net metering, and encourage faster renewable energy uptake than these other options.[49]

V RENEWABLE ENERGY MANUFACTURING

Renewable energy manufacturing in the United States has shifted in the wake of the Trump administration's policies. An 'America first' protectionist stance on trade, significant funding decreases to the Office of Energy Efficiency and Renewable Energy, and Trump's administration's repeal of Obama-era renewable and clean energy goals has focused the Trump administration's energy policies on non-renewable energy sources such as coal and natural gas. The most dramatic effect of changing policy priorities has been on US-manufactured solar panels. More than 80 per cent of US solar installations use imported panels, with most manufactured in Asia. The Trump administration placed a 30 per cent tariff on all imported solar panels, falling to 15 per cent over a period of four years, which was levied in response to competition from Chinese manufacturers. The 30 per cent tariff has added about 10 cents per watt to the cost of solar energy in the United States,[50] but the imposition of these tariffs did not appear to slow down development of solar projects, with a record 8.5GW of utility solar projects procured in the first half of 2018.[51] With manufacturing accounting for only

47 See Karlynn Cory and Toby Couture, State Clean Energy Policies Analysis (SCEPA) Project: An Analysis of Renewable Energy Feed-in Tariffs in the United States, National Renewable Energy Laboratory (June 2009).

48 id.

49 id.

50 International Trade Commission and Bloomberg New Energy Finance (2017) in Chris Martin, Jim Efstathiou and Air Natter, *World's Biggest Solar Players Say Trump's Tariffs Could Have Been Worse*, Bloomberg (2018) https://www.bloomberg.com/news/articles/2018-01-23/world-s-solar-leaders-say-trump-s-tariffs-could-have-been-worse.

51 See Nichola Groom, 'U.S. utility solar contracts "exploded" in 2018 despite tariffs: report', 12 September 2018, Reuters, available at https://www.reuters.com/article/us-usa-solar-idUSKCN1LT0EU.

20 per cent of jobs in the solar industry,[52] the most pronounced effect of the tariff and shifting US priorities for renewables is the increased cost of solar panels, triggering a possible slowdown in future solar deployment and innovation.

Despite energy policy shifts away from renewable energy sources, renewable wind and solar energy reached 8.8 per cent of total electrical generation in 2018 in the United States.[53] This increase in generation has been attributed to continued growth of US wind turbine and solar panel manufacturing. With more than 500 US manufacturing facilities specialising in wind power components, centred mostly in the east and north-east United States, costs for commercial and distributed wind technology have dramatically dropped, with wind turbine technology exports growing from US$16 million in 2007 to more than US$100 million annually.[54]

Further opportunities and challenges abound in the electrification of the transportation system. The ongoing succession of petrol-powered vehicles by plug-in electric vehicles (EVs), an ongoing trend that is projected to continue, entails a concomitant increase in electric energy demand.[55] In fact, EVs could create up to 774TWh of electricity demand (on par with the entire US industrial sector);[56] electricity demand from all types of EVs (including passenger EVs, commercial EVs and e-buses) is projected to rise from 74TWh in 2019 to 2,333TWh by 2040.[57] The conventional wisdom from the previous decade has been that night-time charging would alleviate strain on the electric grid. Yet, recent experience has been that solar energy production in the middle of the day has outstripped demand in areas with high solar retention. Plug-in electric vehicles, and other forms of electric storage, are a congenial solution to the problem of overproduction during peak solar hours, by providing a way to 'store' excess solar energy remotely. Accordingly, policies (from those that determine charging station locations to time-of-use rates for electricity) aimed at having consumers charge EV batteries with energy from renewable sources would do well to track this relationship.

52 See Nichola Groom, 'China's solar subsidy cuts erode the impact of Trump tariffs', 30 August 2018, Reuters, available at https://www.reuters.com/article/us-usa-solar/chinas-solar-subsidy-cuts-erode-the-impact-of-trump-tariffs-idUSKCN1LF18K.

53 US Energy Information Administration, Cara Marcy, *U.S. renewable electricity generation has doubled since 2008*, (19 March 2019) https://www.eia.gov/todayinenergy/detail.php?id=38752. In 2018, wind and solar generation accounted for 6.5 per cent and 2.3 per cent respectively of total electricity generation.

54 Office of Energy Efficiency and Renewable Energy, 'Wind Manufacturing and Supply Chain', available at https://www.energy.gov/eere/wind/wind-manufacturing-and-supply-chain.

55 See Electric Vehicle Outlook 2019, Bloomberg New Energy Finance (2019).

56 See Samantha Raphelson, 'U.S. Utilities Look To Electric Cars As Their Savior Amid Decline In Demand', NPR Here & Now Compass (29 March 2018) https://www.npr.org/2018/03/29/598032288/u-s-utilities-look-to-electric-cars-as-their-savior-amid-decline-in-demand.

57 See Electric Vehicle Outlook 2019, Bloomberg New Energy Finance (2019).

VI CONCLUSIONS AND OUTLOOK

Despite the fears and uncertainties arising from the shift in US policy priorities away from clean technology, and expiring government subsidies and tax credits, the renewable energy industry has continued to grow.[58] Moreover, there have been noteworthy developments in the US offshore wind energy sector due to technological improvements and governmental support at the state level.[59]

Looking to the future, any increase in renewable capacity must account for the challenges of lower demand for electricity for industrial and commercial customers, and those posed by the mass adoption of EVs – not only for individual passengers, but also for municipal and commercial purposes. The electrification of the transportation sector requires utilities to increase capacity, upgrade infrastructure and adopt demand-management techniques,[60] such as time-of-use rates, to support the influx in demand and prevent displaced fossil fuels from being replaced by dirty 'peaker' plants.[61] The marriage of renewable energy and the electrification of transportation will be supported by the country's increased funding for electric transportation research[62] and states' growing RPSs.[63] In addition, the deployment of energy storage and other technology advances in the renewable energy industry will help transform the intermittent nature of wind and solar resources to enable these low-cost renewable energy sources to ultimately function as more reliable baseload facilities. Moreover, given that renewable energy projects are now lower-cost generation resources than ageing coal and oil-fired plants, market forces will likely continue to drive investments in clean energy projects despite the phasing out of current US federal tax benefits.

58 See Chrissy Astbury, *How America's Solar Energy Policies Should Follow (and Stray) from Germany's Lead: Working Towards Market Parity Without Subsidies*, 27 Ind. Int'l & Comp. L. Rev. 2019 (2017).

59 In New Jersey, the Governor signed an executive order aimed at achieving 3.5GW of offshore wind generating capacity (see Executive Order No. 8, signed on 31 January 2018, available at https://nj.gov/infobank/eo/056murphy/pdf/EO-8.pdf), and the Public Service Commission of the State of New York issued an order adopting an offshore wind standard (see Order Establishing Offshore Wind Standard and Framework for Phase 1 Procurement, issued and effective 12 July 2018, available at http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7b37EE76DF-81B1-47D4-B10A-73E21ABA1549%7d) authorising solicitations by the New York State Energy Research and Development Authority (NYSERDA), after which NYSERDA issued its first solicitation (see the NYSERDA website: https://www.nyserda.ny.gov/All-Programs/Programs/Offshore-Wind/Offshore-Wind-Solicitations/Generators-and-Developers/2018-Solicitation).

60 See Keith Dennis, Ken Colburn and Jim Lazar, *Environmentally Beneficial Electrification: The Dawn of 'Emissions Efficiency'*, The Electricity Journal, Vol. 29 Issue 6 (2016).

61 See Kevin Bullis, 'Could Electric Cars Threaten the Grid?', MIT Technology Review, 6 August 2013, available at: https://www.technologyreview.com/s/518066/could-electric-cars-threaten-the-grid/; News Release: NREL Research Determines Integration of Plug-in Electric Vehicles Should Play a Big Role in Future Electric System Planning, prepared by National Renewable Energy Laboratory, available at: https://www.nrel.gov/news/press/2018/nrel_research_determines_integration_of_electric_vehicles.html; Stephen Schey et al., 'A First Look at the Impact of Electric Vehicle Charging on the Electric Grid in The EV Project', EVS International Battery, Hybrid, and Fuel Cell Electric Vehicle Symposium, at 1, 2 (May 2012).

62 See, e.g., Office of Energy Efficiency & Renewable Energy, *Energy Department Announces $15 Million for Batteries and Electrification to Enable Extreme Fast Charging*, (23 October 2017) https://www.energy.gov/eere/articles/energy-department-announces-15-million-batteries-and-electrification-enable-extreme.

63 See Utility Dive, *Transportation Electrification Should Build on Energy Efficiency and Renewables Program Success*, (13 April 2018) https://www.utilitydive.com/news/transportation-electrification-should-build-on-energy-efficiency-and-renewa/521008/.

Chapter 18

VIETNAM

Nguyen Viet Ha and Nguyen Hong Hai[1]

I INTRODUCTION

On 25 November 2015, the Prime Minister approved 'Vietnam's Renewable Energy Development Strategy up to 2030 with an outlook to 2050' (the Strategy), which sets out an ambitious plan for the country to achieve by 2050: total power generated from renewable sources to account for 44 per cent of total generated electricity.[2]

The Strategy recommends that the government:

a initiate a renewable energy market;
b introduce reasonable feed-in tariffs (FITs) and investment protection policy;
c set out applicable renewable energy standards;
d regulate the net-metering mechanism;
e grant incentives for development and use of renewable energy (e.g., import duty, corporate income tax and land use rights); and
f impose an environmental protection fee on energy projects using fossil fuels, to provide a fund for the development of renewable energy.

Over the past year, legal reforms on renewable energy have continually been pursued to create a more stable and profitable investment environment in this field. The year 2019 is a transitional year in which numerous regulations will be replaced by new energy policies, promising to attract more foreign investors to Vietnam and gradually completing the national mission on renewable energy as stated in the Strategy.

II THE YEAR IN REVIEW

On 18 March 2016, the Prime Minister issued Decision No. 428/QD-TTg (generally referred to as the Revised Power Development Master Plan VII (the Revised PDP 7)). The Revised PDP 7 contemplates that the total installed capacity of electricity generated from hydroelectric plants will be up to 21,600MW by 2020 and 27,800MW by 2030; from wind it will be 800MW (2020) and 6,000MW (2030); and from solar it will be 850MW (2020) and 12,000MW (2030). The ratios of hydroelectric, wind, biomass and solar power in relation to total power generated in 2030 will be 15.5 per cent, 2.1 per cent, 2.1 per cent and 3.3 per cent respectively. On 9 August 2018, the Prime Minister implemented Decision No. 995/QD-TTg, directing the Ministry of Industry and Trade (MOIT) to prepare the

1 Nguyen Viet Ha and Nguyen Hong Hai are partners at Lexcomm Vietnam LLC.
2 Decision No. 2068/QD-TTG of the Prime Minister dated 25 November 2015.

power development plan for the period from 2021 to 2030 with an outlook to 2050 (the PDP 8). At the time of writing, the MOIT is working on preparing a draft PDP 8. Predictably, renewable energy will constitute a greater proportion of the total installed capacity.

Notably, the second half of 2018 witnessed a sharp increase in the number of solar power projects. According to MOIT data, by the end of 2018, investors registered a total of 10,000MW of solar power, of which 8,100MW, in 121 projects, were included in the Revised PDP 7 and over 100 projects have had power purchase agreements (PPAs) executed.[3] However, the market development of wind, biomass and solid-waste power projects has been poor in comparison with that of solar power projects. Overall, the power generated from green energy sources amounted to 2.1 per cent of the total power produced in 2018.[4]

III THE POLICY AND REGULATORY FRAMEWORK

i The policy background

Vietnam has not completed a national master plan for the development of renewable energy.

Under the current energy regime, the provincial people's committees propose plans for renewable energy projects in their province. Given the lack of transparency and the low management capability at local government level, this decentralised planning procedure has resulted in a short-term and limited local approach to renewable energy in Vietnam. In some regions, the short-term and incomplete nature of planning for wind and solar power projects leads to an overlap between land planned for energy and areas planned for mining activities. Some individuals have abused this loophole to exploit mineral sources, using renewable energy projects to disguise their true intentions.[5]

In general, Vietnam grants ordinary but not special incentives for renewable energy projects, in the same manner as it does to encourage other investment projects in other sectors. This policy of 'ordinary incentives' does not make the project viable from the developers' and lenders' point of view. Renewable energy projects are governed by laws at two levels: general requirements for all types of energy projects and specific regulations for each type of renewable energy.

Like other energy projects, renewables projects are obliged to comply with regulations on (1) power development plans, (2) the power purchasers and power purchase agreement (PPA) execution process, and (3) approvals and consents from the authorities.

Grid-connected renewable energy projects must be included in a regional or national power development plan before reaching the implementation stage. This step is required to ensure that there is enough land for the project. Furthermore, depending on the installed capacity of the project, the Prime Minister, or the MOIT, has to approve the project for inclusion in the relevant power development plans. For example, solar and wind power projects with capacity equal to or greater than 50MW will be approved by the Prime Minister,

3 Anh Minh, Việt Nam đang chứng kiến làn sóng đầu tư vào năng lượng tái tạo (12 March 2019), VnExpress, https://vnexpress.net/kinh-doanh/viet-nam-dang-chung-kien-lan-song-dau-tu-vao-nang-luong-tai-tao-3893420.html accessed on 17 April 2019 (Vietnamese).

4 ibid.

5 Vietnam Energy Magazine, Không được lợi dụng dự án điện gió để khai thác titan (27 April 2018), http://nangluongvietnam.vn/news/vn/dien-hat-nhan-nang-luong-tai-tao/khong-duoc-loi-dung-du-an-dien-gio-de-khai-thac-titan.html accessed on 17 April 2019 (Vietnamese).

while those with capacity below 50MW will come under the authority of the MOIT. The regulatory body authorised by the MOIT to deal with renewable energy projects is the Electricity and Renewable Energy Authority of Vietnam.

Vietnam Electricity (EVN) remains the sole offtaker for all renewable energy projects, and Vietnam still operates a monopoly 'single-buyer' electricity market, subject to certain exceptions. However, the situation is likely to change as of 1 July 2019.

ii The regulatory framework

There are the following specific pieces of Vietnamese legislation on renewable energy:

a Decision No. 37/2011/QD-TTg (issued on 29 June 2011, and effective as of 20 August 2011), Decision No. 39/2018/QD-TTg (issued on 10 September 2018, and effective as of 1 November 2018), and Circular No. 02/2019/TT-BCT (issued on 15 January 2019, and effective as of 28 February 2019) on wind energy;

b Decision No. 24/2014/QD-TTg (issued on 24 March 2014, and effective as of 10 May 2014), Circular No. 44/2015/TT-BCT (issued on 9 December 2015, and effective as of 25 January 2016), and Circular No. 54/2018/TT-BCT (issued on 25 December 2018, and effective as of 18 February 2019) on biomass power;

c Decision No. 31/2014/QD-TTg (issued on 05 May 2014, and effective as of 20 June 2014) and Circular No. 32/2015/TT-BCT (issued on 8 October 2015, and effective as of 7 December 2015) on solid-waste power; and

d Decision No. 11/2017/QD-TTg (issued on 11 April 2017, and effective as of 1 June 2017), Decision No. 02/2019/QD-TTg (issued on and effective as of 8 January 2018), Circular No. 16/2017/TT-BCT (issued on 12 September 2017, and effective as of 26 October 2017), and Circular No. 05/2019/TT-BCT (issued on 11 March 2019, and effective as of 25 April 2019) on solar power. Decisions No. 11/2017/QD-TTg and No. 02/2019/QD-TTg expire on 30 June 2019.

In addition to this specific legislation, renewable energy projects fall within the scope of legislation applicable to all types of energy projects in Vietnam – that is, laws on electricity, construction, environment and so on – and in the adoption of such laws Vietnam has scope to develop a distinct legal framework for renewable energy projects.

Regulators

The main regulator for renewable energy is either the MOIT (via the Electricity and Renewable Energy Authority (EREA)) or the provincial departments of industry and trade, subject to the capacity of the projects. While the Electricity Regulatory Authority of Vietnam manages the development of all power projects, the EREA has authority and responsibility for regulating FITs for renewable energy.

The Ministry of Natural Resources and Environment (MONRE) and the provincial departments of natural resources and environment approve environmental impact assessments.

The provincial people's committees and district people's committees are heavily involved in not only the provincial renewable-energy development plans, but also the whole development of the projects.

Investment incentives

Overall, renewable-energy projects in Vietnam have been granted incentives as follows:

a exemption from import duties applicable to the imported materials, equipment and facilities forming the fixed assets of the renewable-energy project;

b the same corporate income tax exemptions or incentives as those applicable to projects in other investment priority sectors in accordance with prevailing tax laws and regulations;

c solar power projects, transmission lines and substations connected to the power grid are exempted from or subject to the same reduced land-use fees, land rent and water surface rent as those applicable to projects in other investment priority sectors in accordance with prevailing tax laws and regulations;

d capital mobilisation will be made in accordance with prevailing laws and regulations; and

e in addition to the aforementioned incentives, each particular type of renewable-energy project enjoys distinct and special treatment (see below for details).

EVN offtake obligation

As stated above, subject to certain exceptions, at present, EVN is the sole offtaker for all renewable energy projects, and Vietnam still operates a monopoly single-buyer electricity market. Under the latest draft of the Decision replacing Decisions No. 11/2017/QD-TTg and No. 02/2019/QD-TTg (the Draft Decision on Solar), the term 'electricity purchasers' also includes individuals and organisations other than EVN. This may be a critical change to comply with the development orientation of Vietnam's electricity market, which will transition into a wholesale electricity market in 2019 and a retail electricity market in 2025.[6] It is to be hoped that when the Draft Decision on Solar is officially introduced, this provision will remain the same.

Power purchase agreements

The model PPA for renewable energy projects is mandatory, with different kinds of projects using the same template with minimal changes to specific incentives for each type of project. Furthermore, the bankability of these model PPAs is another critical issue that developers must consider carefully.

Corporate renewable-energy PPAs, subject to certain exceptions, are technically not possible at present, although petitions have been raised on a number of occasions. Nevertheless, under the Draft Decision on Solar, the model PPA only applies to transactions with EVN as a power purchaser.

Solar power

Solar power is the latest renewable source to be promoted by specific legislation, and assurances have been given that it will be the focus of further attention in the future.

Currently, the complete legal framework on solar power projects includes Decision No. 11/2017/QD-TTg (Decision No. 11), Circular No. 16/2017/TT-BCT, Decision No. 02/2019/QD-TTg (Decision No. 02) and Circular No. 05/2019/TT-BCT. As Decision

6 Decision No. 63/2013/QD-TTg of the Prime Minister dated 8 November 2013 on the schedule, conditions and structure of the electricity sector for the formulation and development of electricity market levels in Vietnam.

Nos. 11 and 02 will expire on 30 June 2019, the new decision is being drafted to be officially effective from 1 July 2019. At the time of writing, the MOIT had circulated the third version of the Draft Decision on Solar for public comments.

As noted above, 2018 was the year of solar power projects. In addition to the 121 projects already included in the Revised PDP 7, there are approximately 220 projects waiting to be included. In March 2019, a 100MW solar plant in Dak Lak commenced commercial operation.[7] Numerous projects are in the process of completing the steps necessary to start operation before 30 June 2019 to enjoy the FIT at 9.35 US cents/kWh.

The following are highlights from the specific regulations on solar power projects.

Types of solar PV projects

The current legislation regulates solar power projects that generate electric power through the use of solar panels to directly convert energy from sunlight into electricity (i.e., the conventional solar photovoltaic (PV) power system). Other types of solar power generation, such as thermal or concentrated solar power or hybrid solar power systems, are not included in this regime.

Decision No. 11 classifies two types of solar PV projects: (1) roof-mounted and (2) grid-connected solar projects. Roof-mounted projects are clarified as those that use solar panels made up of PV cells installed on the rooftops of residential or commercial buildings, or around the premises of those buildings, and that connect to the national grid or the EVN electric grid. Projects that are connected to the national grid or the EVN electric grid but are not roof-mounted projects are classified as grid-connected projects.

The Draft Decision on Solar continues to classify two types of solar PV projects, as applies under Decision No. 11, but with more detailed forms of each project type; for example, grid-connected projects now include floating solar projects (i.e., projects with panels installed on water surfaces) and ground-mounted solar projects (i.e., (1) projects with panels installed on the ground, and (2) roof-mounted projects with a capacity of over 1MWp). Furthermore, roof-mounted projects include the following use models: (1) using power (power generated from the panels will be used by the seller, with any excess being sold to the national grid); (2) selling excess (power generated will be sold to purchasers, with any excess being sold to the national grid); (3) selling all (power generated will be sold entirely to the national grid); and (4) direct power purchasing (power generated will be sold entirely to other individuals or organisations, without using power from the national grid).

FIT

For grid-connected solar projects with solar-cell efficiency greater than 16 per cent or solar-module efficiency greater than 15 per cent, a FIT will be fixed at 2,086 Vietnamese dong/kWh (equivalent to 9.35 US cents/kWh excluding VAT) for generating electricity at the delivery point.

Regarding roof-mounted solar projects, a FIT of 2,086 dong/kWh (equivalent to 9.35 US cents/kWh excluding VAT) theoretically applies. The power generated will be calculated separately by different meters at delivery and receipt points.

However, the FIT price for both types of solar project is applicable only to projects with a commercial operation date (COD) before 30 June 2019, and this price remains in effect for

7 Anh Minh; see footnote 3.

20 years from the COD. The Prime Minister agreed to extend to the end of 2020 the COD for solar power projects (2,000MW) in Ninh Thuan province that have already been included in the Revised PDP 7, so that they can benefit from the FIT at 9.35 US cents/kWh. In fact, there is a possibility that many solar projects will not reach their COD by 30 June 2019, although they are qualified to be connected to the grid. This is because the national grid has no adequate capacity left for these projects, and EVN has insufficient resources to conduct acceptance tests. Therefore, the question is whether these projects will still benefit from the FIT of 9.35 US cents/kWh or will have to accept a new FIT for the period commencing 1 July 2019. At the time of writing, the government had not issued clear instructions, so the situation remains uncertain.

The Draft Decision on Solar introduces a mechanism in which applicable FITs for projects shall be determined on the basis of four radiation regions and three solar power technologies. A total of 63 provinces and cities would be divided into four regions, with projects in Region 1 enjoying the highest FIT rate, and those in Region 4 receiving the lowest.[8] The FIT rate would also differ according to the form of the solar power project, namely floating, ground-mounted or roof-mounted. The following table sets out the FITs proposed under the current Draft Decision on Solar.

	Region 1 FIT		**Region 2 FIT**		**Region 3 FIT**		**Region 4 FIT**	
Solar technology	Dong/ kWh	Equivalent US cent/ kWh	Dong/ kWh	Equivalent US cent/ kWh	Dong/ kWh	Equivalent US cent/ kWh	Dong/ kWh	Equivalent US cent/ kWh
Floating solar projects	2,281	9.98	1,963	8.59	1,758	7.69	1,655	7.24
Ground-mounted projects	2,102	9.20	1,809	7.91	1,620	7.09	1,525	6.67
Roof-mounted projects	2,486	10.87	2,139	9.36	1,916	8.38	1,803	7.89

The proposed FITs are planned to apply for projects reaching COD from 1 July 2019 to 31 December 2021. The MOIT is considering applying an auction mechanism after this period.[9]

Other requirements

Both types of solar PV projects whose capacity is equal to 1MW or higher must comply with the national or regional power development plans and are required to fulfil the MOIT licensing requirements. Additionally, the land used must not exceed 1.2ha/1MW.

Wind power

As with solar projects, wind power projects in Vietnam possess huge potential for growth. According to a report by the Vietnam Energy Association, coastal cities and provinces in Vietnam have recognisable development potential for wind power installations on land of a capacity of up to 40,000 to 50,000MW. When counting in the installation of offshore wind

8 According to the previous version of the Draft Decision on Solar, Region 1 is understood to contain the areas that receive the lowest levels of solar radiation (mostly Northern provinces, such as Son La and Tuyen Quang), while the provinces in Region 4 (such as Phu Yen, Ninh Thuan and Binh Thuan) benefit from the highest solar radiation levels.

9 ibid.

power projects, this could increase to 100,000MW of total installed capacity.[10] Additionally, the MOIT has approved master plans for wind power developments in some regions in Vietnam. For instance, by 2030, the Ca Mau wind power installation is tentatively expected to be developed to a capacity of 3,607MW;[11] and the projected figure for Binh Thuan province is 2,500MW.[12]

Following the introduction of Decision No. 37/2011/QD-TTg (Decision No. 37), seven years ago in 2011, the government has now amended the policy on wind power to attract more investors with the implementation of Decision No. 39/2018/QD-TTg (Decision No. 39) to amend Decision No. 37, and Circular No. 02/2019/TT-BCT to replace Circular No. 32/2012/TT-BCT.

The huge potential for wind, together with the incentives, has encouraged developers to undertake large-scale projects, such as the Ke Ga project (3,400MW), Bac Lieu (Cong Ly Phase 1 and Phase 2) project (with total installed capacity of over 99MW), Huong Linh 2 project (30MW) and Dam Nai Phase 2 (40MW in total).

The most notable incentives and the requirements for wind power are as follows.

FIT

The government has set new FITs for wind power projects based on the project type. Specifically, Decision No. 39 classifies wind power projects into two types: onshore plants and offshore plants. Onshore power projects are grid-connected wind power projects with wind turbines constructed and operated onshore and on coastal land areas whose outer border is at the lowest average sea edge (averaged over 18.6 years), while offshore projects are grid-connected wind power projects with wind turbines constructed and operated off the coast beyond the lowest average sea edge (averaged over 18.6 years). The FIT for onshore wind power projects is 1,298 dong/kWh (8.5 US cents/kWh) and for offshore projects it is 2,223 dong/kWh (9.8 US cents/kWh). The tariffs are exclusive of VAT.

The FITs under Decision No. 39 apply to part or whole grid-connected wind power projects reaching COD before 1 November 2021 and remain in effect for 20 years from COD. For the period after 1 November 2021, the government has clearly instructed the MOIT to study auction mechanisms and prepare a new FIT policy.

Requirements

Wind turbines deployed in projects must not have been used before and their production date must not be more than five years old; if used turbines are proposed, the developer must apply to the MOIT for review and approval.

The construction of wind power plants may only be commenced when the project owner has (1) satisfied all construction conditions pursuant to the relevant laws, (2) signed

10 Vietnam Energy Magazine, Thông tin mới nhất về tiềm năng điện tái tạo Việt Nam (14 August 2017), http://nangluongvietnam.vn/news/vn/dien-hat-nhan-nang-luong-tai-tao/nang-luong-tai-tao/thong-tin-moi-nhat-ve-tiem-nang-dien-tai-tao-viet-nam.html accessed on 16 March 2018 (Vietnamese).

11 Decision No. 1402/QD-BCT dated 11 April 2016 providing masterplan for wind power development of Ca Mau province until 2020/2030.

12 Decision No. 4715/QD-BCT dated 16 August 2012, http://binhthuantpc.vn/bai-viet/bo-cong-thuong-phe-duyet-quy-hoach-phat-trien-dien-gio-tinh-binh-thuan-giai-doan-2011---2020,-tam-nhin-den-nam-2030-18.html.

a PPA with a power purchaser, (3) signed a grid-connection agreement with the power distribution or transmission entity, and (4) had wind measurement assessments conducted consecutively for at least 12 months.

The land used for the project must not exceed 0.35ha/MW (0.3ha/MW for temporary land use).

Biomass power

As a developing agricultural country, Vietnam produces a vast number of agricultural products, such as rice, sugar cane and coffee. As a result, millions of tons of waste are created, such as straw, rice husks, bagasse, coffee husks, coir, wood or wood residues, and other agricultural or industrial by-products, and these constitute a very valuable biomass resource. On 24 March 2014, the Prime Minister promulgated Decision No. 24/2014/QD-TTg on Support Mechanisms for Development of Biomass Power Projects in Vietnam (Decision No. 24), which was followed and facilitated by Circular No. 44/2015/TT-BCT on Biomass Power (Circular No. 44) and Circular No. 54/2018/TT-BCT (Circular No. 54) on Biomass Power.

Types of biomass power projects

Circular No. 44 classifies biomass electricity projects into two types, based on whether the biomass project is built and connected to the national power grid or not. A grid-connected biomass project can supply power partially or wholly to the national grid. Distinct from grid-connected biomass electricity projects, a non-grid-connected biomass power project is a biomass power plant project built to supply its entire power output to households in certain areas not connected to the national power grid, and the pricing of the electricity from these non-grid-connected projects is not strictly regulated by the Vietnamese authorities.

Electricity and heat cogeneration, or combined heat and power (CHP), is another type of biomass power project that falls within the remit of the MOIT. Defined as biomass power projects that simultaneously provide heat and electricity, CHP projects are sometimes called co-firing biomass power projects. This type of biomass electricity project is widely expected to be deployed in future not only in new biomass projects, but also in existing thermal electric power plants in Vietnam.

FIT

Decision No. 24 sets out the electricity selling price for grid-connected biomass power projects as follows:

a for combined heat and power projects: 1,220 dong/kWh (5.8 US cents/kWh excluding VAT). Electricity selling prices are adjusted according to fluctuations of the dong/US$ exchange rate; and

b for other biomass power projects: according to the Avoided Cost Tariff (ACT) for biomass power projects issued by the MOIT annually.

A new ACT is announced annually. Where the tariff applicable to biomass power projects has not yet been announced, the previous year's tariff shall be used temporarily, until the tariff applicable to the new biomass power projects is announced. The difference between the calculation under the old tariff and the new tariff shall be refunded to buyers or sellers, whichever is appropriate, in the first payment following application of the new tariff.

Since 18 February 2019 (i.e., the effective date of Circular No. 54), the electricity price for non-grid-connected biomass power projects has ceased to be government-assisted.

Solid-waste power

Given that Vietnam's population, as at 17 April 2018, stands at over 97 million, the country generates a huge amount of solid waste. The amount of solid waste generated nationally is estimated at about 70,000 tons per day. In large cities such as Hanoi and Ho Chi Minh City, this figure can be over 9,000 tons per day.[13] Therefore, Vietnam has great potential for solid-waste power (or waste-to-energy).

The government has also identified solid waste as a source of renewable energy to be promoted. According to plans scheduled up until 2050, most of Vietnam's urban solid waste will be used to produce electricity.[14] On 5 May 2014, the Prime Minister issued Decision No. 31/2014/QD-TTg (Decision No. 31) on the Support Mechanism for Development of Power Generation Projects Using Solid Waste in Vietnam. Then, on 8 October 2015, the MOIT promulgated Circular No. 32/2015/TT-BCT to clarify provisions under Decision No. 31 and issue a model PPA. Together, they constitute a legal framework to promote the development of solid-waste energy projects in Vietnam.

Types of solid-waste power projects

Under the laws of Vietnam, there are two types of solid-waste power whose development the government is promoting. In the first type of project, solid waste is directly incinerated to produce electricity. The second type produces electricity from combusted gas collected from solid-waste landfill sites.

FIT

For projects producing electricity by directly incinerating solid waste, the FIT price is at 2,114 dong/kWh (10.05 US cents/kWh excluding VAT). For combusted-gas projects, the FIT price is at 1,532 dong/kWh (7.28 US cents/kWh excluding VAT). The above prices are adjusted with the fluctuation of dong/US$ exchange ratios.

IV RENEWABLE ENERGY PROJECT DEVELOPMENT

In Vietnam, most power projects have to be financed. Overall, senior debt is the most common type of financing for renewable energy projects. Currently, there are numerous stakeholders from various sectors interested in renewable energy projects in Vietnam, such as development banks, commercial banks, funds, governments and strategic investors.[15] The specific mechanisms for solar and wind projects legally require developers to maintain equity percentage of at least 20 per cent of the total project capital (i.e., the debt or other finance support must not exceed 80 per cent of the total investment capital).

13 Phuong Nhung, Điện rác kén nhà đầu tư (5 January 2019), *Labour* newspaper (Vietnamese).

14 Quyen Luu, Việt Nam còn nhiều tiềm năng biến rác thải thành nguyên liệu cho sản xuất năng lượng (19 August 2017), MOIT Official Website, http://moit.gov.vn/tin-chi-tiet/-/chi-tiet/viet-nam-con-nhieu-tiem-nang-bien-rac-thai-thanh-nguyen-lieu-cho-san-xuat-nang-luong-5992-16.html accessed on 19 March 2018 (Vietnamese).

15 Aurélien Agut, Tran Truong Han, Vu Chi Mai, Peter Cattelaens, Wind Power Investment Guidelines for Vietnam (July 2016), MOIT/GIZ Support to the Up-Scaling of Wind Power in Viet Nam.

Additionally, the development of distributed and residential renewable energy in Vietnam is in the early stages and requires more incentives. Although there is huge potential, the capacity of roof-mounted solar projects is only 8.18MWp, with 850 projects, according to the EVN data as at 12 January 2019.[16]

V RENEWABLE ENERGY MANUFACTURING

The government exempts taxes for imported goods that are used to constitute the fixed assets of renewable-energy projects. Therefore, imported wind turbines, solar panels, etc. for project construction are exempted from tax.

Domestic manufacturers of renewable-energy products also enjoy government incentives, similar to incentives for preferred and promoted investment, such as incentives on taxes and land.

However, the interpretation of tax regulations may vary in different provinces, albeit under the same laws. Therefore, whenever inconsistencies occur, guidelines and official instruction from the state's tax authority are required to provide clarification.

VI CONCLUSIONS AND OUTLOOK

Going forward, we believe that renewable energy will form an essential part of a diverse energy mix of available low-carbon generating technologies in Vietnam.

However, the support system for the deployment of renewables generation (including solar energy, onshore and offshore wind, and biomass energy) has left a lot to be desired from the perspective of project developers and financiers. FITs and critical PPA contractual terms are the principal issues to be resolved to facilitate the development and financing of long-term utility-scale renewable energy resources. In addition, the insufficient transmission and distribution capacity of the national grid is also a hindrance for the development of the renewable energy projects.

Although renewable energy mechanisms have been adopted, the development of projects and fulfilment of the 2030 target are facing numerous challenges.

Regarding solar projects, the high demand for the land used is a problem. A solar plant normally requires a large area for the construction and installation of the solar panels, which leads to planning difficulties. In addition, although there are numerous solar power projects registered for development, most are in Ninh Thuan and Binh Thuan, whose infrastructure systems are now overloaded.

In respect of wind power, the actual installation of wind power projects has not reached the projected goal because of the pace of the installation work; therefore high input costs lead to high calculated electricity prices while the FIT is fixed.

Although Vietnam has potential for the development of solid-waste power projects, the number of investors keen on this type of project is minimal. This is because the investment

16 Chi Nhan, Bỏ cơ chế bù trừ điện mặt trời trên mái nhà (12 January 2019), *Thanh Nien* newspaper, https://thanhnien.vn/tai-chinh-kinh-doanh/bo-co-che-bu-tru-dien-mat-troi-tren-mai-nha-1042725.html accessed on 18 April 2019 (Vietnamese).

costs are high, especially the costs for technology and waste classification. Therefore, only developers with strong financial capacity are able to invest in solid-waste power plants. As at January 2019, the total installed capacity of solid-waste plants was 9.03MW.[17]

The government is finding ways to deal with these challenges. The Draft Decision on Solar can be seen as an effort by the government to solve the problems that solar projects are facing. It is evident that, in reviewing the proposed FIT mechanism, the government is granting more incentives for projects not using land (i.e., floating and roof-mounted) and promoting investment in solar plants across the country, instead of focusing on only a few areas.

The government is considering the suitability of wind energy auctions as a support mechanism for Vietnam. Using the auction mechanism, the energy market would be more competitive, if also more complicated and with increased risks for investors. However, although using the auction mechanism would provide an increased measure of control in the planning and deployment of renewable energy, this is not a primary objective in Vietnam and lower electricity procurement costs would be the most significant benefit. In the case of Vietnam, an immediate shift from FITs to auctions is not recommended as it is necessary to first establish certain preconditions in the coming years. FITs could continue to be used for onshore wind energy (a mature technology). However, auction-based support can be used for near-shore wind energy projects, since calculating costs for these types of projects and setting FIT rates is more challenging. A suggested timeline for introducing auctions is:

a 2018–2020: amending the FIT system;
b 2018–2023: preparing for auctions implementation; and
c 2020–2023: parallel use of FITs and auctions for existing projects.

Meanwhile, solutions for solid-waste and biomass are still in question. We expect that the government, in cooperation with international experts, will find the best way to develop renewable-energy projects in Vietnam, contributing both to the development of a new era of the economy and taking a new generation another step closer to a widespread application of renewables technologies.

17 Phuong Nhung, Điện rác kén nhà đầu tư (5 January 2019), *Labour* newspaper (Vietnamese).

Appendix 1

ABOUT THE AUTHORS

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HFW

Simon Adams specialises in commercial law with particular emphasis on energy and competition law.

Simon has extensive experience in the energy industry, particularly electricity and gas. He advises on all aspects of the power industry, both renewable and conventional, including facility construction, operation and maintenance, power procurement and retail sales, electricity network access and services, metering and regulation. In the gas sector, he advises on gas procurement and transport, pipeline construction and access, gas tolling, storage, aggregation and retail arrangements.

He also acts on energy disputes and has been appointed to the legal panel of the Western Australian Energy Review Board.

Simon's previous experience includes acting in-house as senior legal counsel with a state-owned electricity and gas retailer. He recently acted on the merger of that entity with the state-owned generator.

He has also acted for various regulators, including the Australian Competition and Consumer Commission, the operator of the Western Australian Wholesale Electricity Market and the Western Australian Economic Regulation Authority.

Simon's understanding of the electricity regulatory regime of Western Australian has benefited from his role in assisting drafting key pieces of Western Australian legislation regulating the electricity industry, including the Metering Code, amendments to the Electricity Networks Access Code and the Wholesale Electricity Market Rules, including the introduction of two new markets.

Simon is qualified in Western Australia (Australia).

HERMENEGILDO ALTOZANO

Bird & Bird

Hermenegildo Altozano is a partner and heads Bird & Bird's energy and utilities practice in Spain.

He specialises in energy law, regularly advising on projects and transactions in Spain and Latin America, and has broad experience in investment protection and arbitration in Latin America.

Hermenegildo joined Bird & Bird from Hogan Lovells, where he headed the energy and natural resources practice in Spain. Before that, he was a partner in the energy

department at Eversheds Lupicinio. Between 1994 and 1996, he was visiting attorney at Bracewell's Houston offices, where he specialised in energy and natural resources, and in Latin American investments.

Hermenegildo is considered by the main international law directories (including *Chambers*) to be the top expert in foreign investment in Cuba, where he regularly advises key market participants in the energy (power, oil and gas), natural resources, aviation, agribusiness, tourism, food and infrastructure industries. He was part of the legal team that first formulated the rules governing the Cuban electricity market in 1997. Hermenegildo has also advised private investors in energy industry-related disputes in the Dominican Republic, Nicaragua and Cuba, and he has participated in several investment arbitration proceedings pursuant to the Energy Charter Treaty.

He is co-director of the Energy and Regulation Forum of the Foundation for Research on Law and Business (FIDE), associate professor of private international law at Francisco de Vitoria University, Madrid, and was formerly the director of the energy law programme at IE Business School, Madrid. Hermenegildo regularly takes part in the radio programme La Tertulia Capital on Capital Radio (105.7 FM).

He received the International Law Office Client Choice award as best energy lawyer in Spain in 2010, 2011 and from 2013 to 2016. He was also voted lawyer of the year for the natural resources industry by *Best Lawyers* in 2012 and 2016.

ANA CAROLINA BARRETTO

Veirano Advogados

Ana Carolina Barretto leads the projects practice at Veirano Advogados in São Paulo, Brazil. She specialises in the areas of project finance and infrastructure development, and has significant expertise in the infrastructure and natural resources industries. Ana Carolina is widely recognised by international publications such as *Chambers Global* and *Chambers Latin America*, *The Legal 500*, *IFLR1000*, *Latin Lawyer 250*, Euromoney's *Expert Guides* and *Who's Who Legal* as a leading lawyer for project development and finance, and energy and construction law. She holds a law degree from the Pontifical Catholic University of Rio de Janeiro, a *Magister Juris* and a Master of Legal Studies from the University of Oxford, United Kingdom, where she was a Chevening scholar.

CARSTEN BARTHOLL

Taylor Wessing Partnerschaftsgesellschaft mbB

Carsten Bartholl heads Taylor Wessing's energy industry group. He advises on transactions and financing, primarily in connection with renewable energy projects, and on investments in technologies for the avoidance or reduction of CO_2 emissions. His practice includes ongoing consultancy services for relevant investment schemes. Regarding renewable energy projects, Carsten has substantial experience in advising in cross-border projects in transactions throughout Europe and worldwide. Recently, he advised in renewable transactions, and in particular on corporate power purchase agreements, in northern and western Europe and Australia.

Carsten studied law in Hamburg and has worked as an attorney since 1996.

LUCIANA BELLIA

Cleary Gottlieb Steen & Hamilton LLP

Luciana Bellia is a senior attorney based in the Italian offices of Cleary Gottlieb. Her practice focuses on European and Italian competition law, in particular merger notifications and antitrust law, including vertical and horizontal agreements, cartels, abuse of dominance, and state aid. She has experience in a number of industries, particularly energy and chemicals. She has been involved in a broad range of merger-control and abuse-of-dominance proceedings before the European Commission and the Italian Antitrust Authority. She graduated with honours from the LUISS Guido Carli University School of Law in 2001. While at law school she was a visiting student at Georgetown University Law Center for a semester on a scholarship granted by the University of Rome. She obtained an LLM in advanced European legal studies from the College of Europe of Bruges in 2006. She is a member of the Palermo Bar.

DMITRY BOGDANOV

CMS Russia

Dmitry Bogdanov is a senior associate in the infrastructure, projects and construction team at CMS Russia. His practice focuses on real estate, construction, contract and corporate law. Dmitry acts on behalf of foreign companies and regularly advises them, particularly in the areas of EPC projects, and greenfield and brownfield development projects in various regions of Russia. He is involved in due diligence and in drafting and negotiating agreements, including in relation to land plot leases, sale and purchase agreements and construction contracts.

Dmitry has also participated in large investment projects in the renewables (wind and solar energy), oil and gas, and automotive sectors.

MARKUS BÖHME

Taylor Wessing Partnerschaftsgesellschaft mbB

Dr Markus Böhme is a member of the environmental, planning and regulatory practice area at Taylor Wessing. He focuses on energy law and advises national and international clients on all transactions in this field.

He is regularly consulted for advice on regulatory matters in the context of the liberalisation of the energy sector. Furthermore, he advises on all aspects of energy supply (gas, electricity, and local and district heating) and on renewable energy, drawing on, among other things, the experience he gained in the legal department of a large German energy supplier. He is regularly involved in M&A transactions and has represented clients in numerous proceedings before the Intermediate Court of Appeals, and before the German Federal Supreme Court.

Markus Böhme received his PhD in 2008 following his law studies at the Rheinische Friedrich-Wilhelms University of Bonn. Markus also participated in the Master of Laws programme (LLM) at Nottingham Trent University.

AMANDA LEAL BRASIL

Veirano Advogados

Amanda Leal Brasil is a projects associate at Veirano Advogados in São Paulo, Brazil, specialising in corporate law, project finance and infrastructure development. She holds a law degree from the Pontifical Catholic University of Rio de Janeiro.

GIULIANA D'ANDREA

Cleary Gottlieb Steen & Hamilton LLP

Giuliana D'Andrea worked as a trainee lawyer based in the Italian offices of Cleary Gottlieb. Her practice focuses on European and Italian competition law, advising on restrictive practices, abuse-of-dominance investigations, state aid and merger-control procedures. She has experience in the energy, telecommunications, banking and chemicals sectors. She graduated with honours from the LUISS Guido Carli University School of Law in 2015 and obtained an LLM in advanced European legal studies from the College of Europe of Bruges in 2019.

KILIAN DE CINTRÉ

Milbank LLP

Kilian de Cintré is a senior associate in the London office of Milbank LLP and is a member of the firm's global projects, energy and infrastructure finance group. He has advised lenders and sponsors on a number of international projects and energy and infrastructure financings specialising in multi-sourced financings involving export credit agencies, multilaterals and commercial banks. Kilian has been involved in many 'market-first' and 'first-in-country' deals across many industries, such as renewables (including solar, wind and biomass projects), natural resources, oil and gas, independent power and infrastructure.

JOHN DEWAR

Milbank LLP

John Dewar is a partner in the London office of Milbank LLP and a member of the firm's global projects, energy and infrastructure finance group. John is widely recognised as a leading individual in his field by a number of journals, among them *Chambers UK* (which designated him among the first tier of project finance lawyers in the UK), *Chambers Global*, *The Legal 500* and *Who's Who Legal: Project Finance*. He has built an extremely broad practice and outstanding reputation for advising on the most innovative and significant 'market-first' transactions around the world. His practice focuses on advising parties in the development and financing of oil and gas, natural resources, independent power, telecommunications, satellite and other infrastructure projects. John has advised on many renewable energy projects, onshore and offshore wind, PV and CSP solar, biomass and waste-to-energy. He has particular expertise in multi-sourced financings, including those involving multilateral and export credit agencies and Islamic institutions.

MARCO D'OSTUNI

Cleary Gottlieb Steen & Hamilton LLP

Marco D'Ostuni is a partner based in the Italian offices of Cleary Gottlieb. He focuses mainly on competition law and on regulation in the energy, telecommunications and media sectors. He has represented clients in some of the leading EU and Italian competition law cases, often in liberalised and heavily regulated sectors.

He is distinguished as a leading lawyer in Italy in competition and EU law by *Chambers Europe*, *The Legal 500 EMEA* and *Who's Who Legal*; in technology, media and telecommunications by *Chambers Europe* and *The Legal 500 EMEA*; and in *Who's Who Legal: Data – Telecoms & Media*. In 2018 and 2014, he was named Italian 'Telecommunications Lawyer of the Year' by online magazine LegalCommunity. He is a member of the Rome Bar and the New York Bar. He is widely published on antitrust matters and regularly lectures at numerous conferences and universities. He graduated with honours (University of Naples Law School, 1996), obtained two LLM degrees (College of Europe of Bruges, 1998, including Best Advocate General prize in the European Law Moot Court Competition; and Columbia University School of Law, 2000, Fulbright and Harlan Fiske Stone Scholar) and holds a PhD in competition law (University of Perugia, 2008).

DONIA EL-MAZGHOUNY

Shahid Law Firm

Donia El-Mazghouny is a partner at Shahid Law Firm and leads the energy and projects team. She specialises in corporate and commercial law, and energy law with a focus on energy and power-specific agreements, such as oil and gas concessions, power purchase and network connection agreements, and private offtake arrangements. Donia also advises clients on the development, financing and acquisition of energy and infrastructure projects in Egypt. In addition to her energy practice, Donia's experience includes advising on transactional matters, corporate and commercial agreements, joint ventures, corporate structuring, and labour matters in the pharmaceutical, manufacturing and industrial, and services fields.

She was admitted to the Egyptian Bar in 2007, and is a member of the International Bar Association (IBA), Women in Clean Energy Egypt (WICE), the local chapter of the initiative launched by the Clean Energy Business Council (CEBC) and the Association of International Petroleum Negotiators (AIPN). Donia regularly speaks at conferences in and outside Egypt, particularly on clean energy.

She holds an LLM in international financial law from King's College London (United Kingdom), a master's degree in international and European business law from Paris I Panthéon-Sorbonne University (France) and an LLB from Cairo University (IDAI) (Egypt).

Donia is recommended by *The Legal 500* particularly for energy, and projects and infrastructure. She is ranked as a 'leading individual' and noted as 'one of the best specialist partners in the energy sector', and as a 'talented partner' who is 'responsive and accurate' and 'highly knowledgeable'. She is also noted as 'a rising star in the renewable energy market', as 'hardworking and diligent' and for 'always going the extra mile'.

TIAGO KÜMMEL FIGUEIRÓ

Veirano Advogados

Tiago Kümmel Figueiró focuses his practice in the areas of mergers and acquisitions, and infrastructure and natural resources. He has corporate, contractual and regulatory experience in connection with infrastructure projects and public utilities, especially in the power sector. Mr Figueiró also advises Brazilian and international clients in the power, gas, sugar and ethanol, water and sewage, and construction sectors in agreements with the public sector, acquisitions, joint ventures, project development, and construction and financing. Tiago has been consistently ranked as a leading practitioner in the power and M&A fields by *Chambers Global*, *Chambers Latin America*, *Who's Who Legal*, *The Legal 500*, *Latin Lawyer 250* and *IFLR1000*. In 2012, Tiago worked as a foreign associate with White & Case LLP in New York.

LIDO FONTANA

Covington & Burling (Pty) Ltd

Lido Fontana is of counsel in Covington's Johannesburg office. He has significant experience in international oil and gas, mining, power, including renewable energy, and large infrastructure development transactions, including public–private partnerships and the United Kingdom's private finance initiative.

JO GARLAND

HFW

Jo Garland has extensive experience in the energy and resources, renewables projects and climate-change fields. Jo has worked on projects at all levels of the supply chain, including one of Australia's largest natural gas projects, a world-leading off-grid solar project, numerous international resources joint ventures and large energy acquisition projects.

Jo has a detailed understanding of the Western Australian electricity market, having acted for the state-owned electricity generator and retailer on numerous matters.

Her climate-change experience includes acting as the lead lawyer for the government on the implementation of the emissions trading scheme and later acting for private entities on the introduction and then removal of that scheme.

Jo is qualified in Western Australia (Australia) and New Zealand.

NNENDA HAYATUDDINI

Detail Commercial Solicitors

Nnenda Hayatuddini is an associate at Detail. She is a core member of Detail's banking, finance and power team, and has advised on several financing transactions in the infrastructure, power, oil and gas and real estate sectors. She brings to Detail her experience in the power sector as a pioneer member of the legal department of the Nigerian Bulk Electricity Trading Plc (NBET) and her innate ability to provide detailed structural advice to clients. Nnenda was part of the team that successfully structured and undertook the negotiation and execution of the power purchase agreement for Nigerian Breweries' first solar-powered brewery in Africa. She is also part of the team advising the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on its Nigerian Energy Support Programme, which involves providing legal advisory services regarding the Nigerian electricity supply industry and GIZ's

efforts at enabling and fostering investments in the renewable energy, energy-efficiency and rural-electrification sectors in Nigeria. She recently facilitated a training programme conducted by GIZ on the Nigerian regulatory framework for off-grid solar projects at the German Project Development Training Week in April 2019, where she spoke on the legal, contractual and regulatory framework for off-grid solar projects in Nigeria. Nnenda obtained her law degree from Kwame Nkrumah University of Science and Technology, Kumasi, Ghana in 2010. She was admitted to the Nigerian Bar in 2012 and obtained her Master of Laws from University College London in 2014.

THOMAS HEIDEMANN

CMS Russia

Dr Thomas Heidemann is a Russia and Eastern Europe expert. He is based in Düsseldorf and Moscow, where he advises on complex transactions in Russia and in central and Eastern European countries. Given Dr Heidemann's 20 years of far-reaching experience, Russian and international clients trust him when it comes to cross-border investments from and to Russia. He works on industrial developments, joint ventures and private equity deals, with special know-how in the automotive sector, and he also advises on investments in renewable energies and other Russian industries.

Thomas heads CMS Russia's German desk in Moscow and the Russian desk in Düsseldorf and, as such, coordinates the German–Russian work in these offices. Before joining CMS, he worked for a large German law firm, where he managed the Russia and Ukraine practice, with offices in Moscow, Saint Petersburg and Kiev.

WATARU HIGUCHI

Anderson Mōri & Tomotsune

Wataru Higuchi has been involved in a wide range of finance transactions, from structured finance to capital markets. Mr Higuchi has particular expertise in equity and bond offerings of non-Japanese companies, listings of non-Japanese companies and funds (ETFs), and structured financing transactions. In addition to his professional experience at Anderson Mori & Tomotsune, Mr Higuchi also worked for the Tokyo Stock Exchange (from October 2012 to September 2013) as a secondee, where he was responsible for formulating the infrastructure fund market rules. Mr Higuchi studied at Hitotsubashi University (LLB) and Columbia Law School (LLM) and is admitted to the Bar in Japan and New York.

DONG EUN KIM

Lee & Ko

Dong Eun Kim leads the project and energy practice group at Lee & Ko. He has a wealth of experience and expertise drawn from advising for over 20 years on all kinds of inbound and outbound transactions related to social overhead capital, energy and real estate development, construction, operation, financing, investment and restructurings. Mr Kim has experience representing all important project stakeholders, such as major project investors, syndicated lenders, project companies and governments. Since 2014, and over a three-year span, he has provided advice on about 125 large inbound and outbound projects related to social overhead capital, energy and real estate.

Notable examples of the aforementioned projects include domestic public–private partnerships (PPP), such as the West Suwon–Osan PPP, the Yongin–Seoul PPP, the Eulsukdo Bridge PPP, the Busan New Port PPP, as well as overseas PPPs, such as the Ivory Coast Abidjan Metro project, Çanakkale Bridge and Highway Project, Kuala Lumpur–Singapore High-Speed Rail project, Tukai Kartanegara coal terminal development project, New Intercity Fleet project in New South Wales, Australia, and Thi Nghe wastewater project in Ho Chi Minh City, Vietnam. Also worth mentioning are domestic energy-related projects, such as the Poseung community energy project, the Pyeongtaek–Gimcheon–Jeonbuk energy project, the Jangmun combined-cycle power plant project, the Goseong coal power generation project and the Jeollanam-do Shinan wind power project; as well as overseas energy-related projects, which include about 10 Japanese solar projects in Hitachi, Kirishima, Wakayama and Hamada, among others. Mr Kim also advised on the wind power project in Tafila, Jordan, the hydroelectric power project in Athmuqam, Pakistan, and the solar power projects in Guam, United States; domestic real estate projects, such as the Pyeongchon G Square complex acquisition, the Capital Tower sale and overseas real estate projects, such as the real estate development projects in Business Bay and Culture Village, Dubai and Bason City, Vietnam, are also to be noted.

Mr Kim has been selected on numerous occasions as a leading lawyer in the fields of project finance, energy and real estate by the top legal ranking institutions, such as *Chambers Asia-Pacific* and *The Legal 500*, and he is regarded as one of the finest experts in those practice areas.

SANGMIN KIM

Lee & Ko

Sangmin Kim is an associate at Lee & Ko. As a member of Lee & Ko's environment, health and safety practice group, she assists clients with legal advice on a broad range of compliance concerns and other issues relating to Korea's various laws and regulations governing environmental protection and public health and safety matters.

Prior to joining Lee & Ko, Ms Kim worked as in-house counsel in the global legal affairs team of Samsung Electronics Co, Ltd, where she acquired extensive experience in various types of cross-border corporate and commercial transactions, and in regulatory compliance issues in the area of environmental law.

DOLAPO KUKOYI

Detail Commercial Solicitors

Dolapo Kukoyi is a partner at Detail and leads the firm's power practice. She is one of the leading lawyers in Nigeria's power sector. Her transactional experience includes advising the Central Bank of Nigeria and the Nigerian Electricity Regulatory Commission (NERC) on the 213 billion-naira intervention fund for the Nigerian electricity supply industry, and advising clients on the privatisation of the Power Holding Company of Nigeria (PHCN) and National Integrated Power Project (NIPP) assets in the Nigerian power sector. Dolapo advised the Nigerian Energy Support Programme (NESP) and NERC in drafting the regulation for mini-grids below or equal to 1MW, and also advised the NESP on structuring mini-grid pilot projects in five states in Nigeria (Niger, Ogun, Sokoto, Cross River and Plateau). She is currently advising the Lagos State government on the Light Up Lagos project to facilitate the delivery of 3000MW through embedded power generation. Dolapo serves as lead for the

Climate Change thematic group of the Sustainability Policy Commission of the Nigerian Economic Summit Group and is an advisory board member of the Renewable Energy Association of Nigeria. Dolapo earned her law degree from the University of Ibadan in 2001 and holds a diploma in intellectual property law from the International Bar Association and the College of Law of England and Wales (2007).

STEFAN LAMPERT

Wolf Theiss Rechtsanwälte GmbH & Co KG

Dr Stefan Lampert is a member of the regulatory team and specialises in public and administrative law. Stefan focuses on construction law, planning and zoning, and environmental law, as well as on energy regulatory issues. He frequently advises clients in relation to environmental impact assessments or conservation issues and has particular experience in connection with renewable energy, especially wind energy. Before joining Wolf Theiss, Stefan worked in the regulatory and administrative teams of other well-known Austrian and regional law firms. Stefan is admitted to the Bar in Austria.

ALEX HAICHUN LU

Grandall Law Firm

Alex Haichun Lu is a partner at Grandall Law Firm, based in Shanghai. Before joining Grandall, he was a senior counsel at a boutique international firm. Alex is particularly experienced in helping foreign clients direct their business in an unfamiliar market, including in relation to entry strategies, joint ventures and partnership arrangements, M&A, due diligence, and a wide range of commercial contracts and employment mattes. He has received extensive recognition for his representation of leading market participants, and for his involvement in both regulatory and commercial issues across a wide array of industries. In particular, in recent years, Alex has dedicated a considerable amount of time to the areas of renewable energy, real estate, private equity and venture capital. In the renewable energy sector, Alex's clients have included major Chinese renewable energy developers, such as GCL, CMIG New Energy and CGN Solar, as well as leading US-based renewable energy funds. In real estate, in addition to advising Chinese real estate developers, he has advised on numerous deals involving the purchase of residential, office and commercial properties in China by foreign real estate funds. Alex's practice also focuses on venture capital and private equity investment in China, and his clients include Softbank, SIG and Highlight Capital.

NGUYEN HONG HAI

Lexcomm Vietnam LLC

Nguyen Hong Hai is a partner at Lexcomm Vietnam LLC and is head of the renewable-energy practice. He is highly regarded for his enthusiasm, distinctive vision, proactive approach and versatility as a young yet experienced corporate and commercial attorney, principally focused on the areas of M&A, inbound and outbound cross-border investments, infrastructure, renewable energy, mining and natural resources, insurance, corporate governance and compliance, and employment.

Hai also has extensive experience in litigation and alternative dispute resolution and has represented many foreign corporate clients dealing with cross-border disputes between international clients and their Vietnamese business partners, as well as dealing with

shareholder disputes among international investors in joint-venture businesses in Vietnam. Hai's litigation experience involves both mutual conciliation and litigation at courts in Vietnam, as well as arbitration at SIAC and VIAC.

Hai holds a Bachelor of Laws from Hanoi Law University and a Master of Laws (LLM in international law) from the Transnational Law and Business University, South Korea.

Hai is admitted to practise in Vietnam as a qualified lawyer of the Hanoi Bar Association and is a member of the Vietnam Bar Federation.

Hai is also currently the Vietnam Chapter chair of the International Section of the New York State Bar Association.

NGUYEN VIET HA

Lexcomm Vietnam LLC

Nguyen Viet Ha is a partner at Lexcomm and the head of the mergers and acquisitions, real estate and construction, technology, media and telecoms, and intellectual property practices, with more than 25 years of legal practice.

In 1994, Ha commenced his legal career, joining Freehills at its Hanoi Branch, as one of the first Vietnamese lawyers in a foreign law firm in Vietnam.

Ha has practised actively in the IT, media and telecoms sector for 20 years. In his role as in-house counsel with Vietnam Post and Telecommunications Group (VNPT), he appeared as lead counsel in charge of many large-scale foreign investment projects (including business cooperation contracts with Telstra, France Telecom, NTT, Korea Telecom, Comvik and Vinasat 1) in Vietnam's telecoms sector from 1994 to 2005.

Ha was also the head counsel for Vietnamobile, a brand of Hutchison Telecom International providing mobile phone services in Vietnam.

Ha is admitted to practise in Vietnam as a qualified lawyer of the Hanoi Bar Association and a member of the Vietnam Bar Federation. He is also a member of the New York State Bar Association.

Following his successful participation in a nationwide legal competition in 2002, Ha was awarded a full scholarship to read a Master of Laws (LLM) at the School of Law, Niigata University (Japan). During the years 2002–2005, Ha focused mainly on e-commerce and M&A in the IT, media and telecoms and energy sectors.

PEDRO PALMA-CRUZ

Sánchez Devanny

Pedro Palma-Cruz is a senior associate at Sánchez Devanny. From 2009 to 2012, Pedro was with the Mexican national Tax Administration Service (SAT), where he specialised in areas such as international tax audits, legal support and international tax affairs, and large-taxpayer legal matters, participating in audits of foreign tax residents, the issuance of tax rulings, and exchange-of-information procedures with foreign authorities in the Mutual Agreement Procedure (MAP). From 2015 to 2016, Pedro was engaged in the field of hydrocarbon verification, participating in audits conducted in the hydrocarbons sector focusing on payments made to foreign tax residents and transfer pricing.

In 2011, he was also designated as an attendant member of Working Group No. 1 of the Organisation for Economic Co-operation and Development (OECD), as part of the Mexico delegation. In the same year, his paper on 'The payment as an event that triggers the benefits of tax treaties' was recognised for inclusion in the Poster Programme of the

65th Congress of the International Fiscal Association (IFA) in Paris, France. In 2018, he was recognised for a second time by the IFA, in the context of its international award for investigative research, for his work on 'The creation of value and the arm's-length principle'.

LUIS ORLANDO PÉREZ-GUTIÉRREZ

Sánchez Devanny

Luis Orlando Pérez-Gutiérrez is a senior associate at Sánchez Devanny in the firm's Monterrey office, where he is a member of the corporate and M&A practice group. He joined Sánchez Devanny in 2007, working with the corporate and M&A, corporate and project finance, and financial institutions and services practice groups.

He has broad experience advising international and domestic corporate clients, institutional investors, private equity funds and family businesses in relation to acquisition operations, multi-jurisdictional and domestic stock and asset acquisition transactions and projects, and in-bound and out-bound equity joint ventures. He advises international banks and financial institutions and international and domestic corporate borrowers on cross-border commercial loans, syndicated loans and project financing, and on all types of security packages and collateralisation. Previously, he worked as a litigation attorney in mercantile and civil matters, representing, among others, a Mexican business group with more than 650 department stores in Mexico, and he has participated in the negotiation and preparation of commercial contracts for several Mexican companies.

Luis also taught stock market law and courses on financial institutions for the finance degree programme at Regiomontana University.

JOSÉ ANTONIO POSTIGO-URIBE

Sánchez Devanny

José Antonio Postigo-Uribe is the managing partner at Sánchez Devanny's Mexico City office. He heads the firm's energy, natural resources and environmental practice group and the firm's energy industry group, which includes practitioners from different law practice areas who specialise in advising clients in the energy sector. He is also a partner in the firm's corporate and M&A practice group.

José Antonio has over two decades of experience with an M&A and transactional background and extensive knowledge of the energy sector. He advises clients on M&A, private equity, general financing, business transaction structuring, joint ventures, corporate restructuring, corporate planning, general corporate law, privatisations, public and private bidding processes, PPPs, project finance, infrastructure development and real estate. He also represents clients in all types of contracts and civil and commercial agreements; in negotiations with governmental entities; in the incorporation of companies and associations; and in the establishment of branches and processes related to acquisitions, divestitures, sales, mergers, spin-offs, and dissolution and liquidation of companies. Local and international clients entrust him with sensitive, complex, and large transactions.

He is the author of several articles in national and foreign publications specialising in corporate, infrastructure and investment matters. He is a regular speaker in different forums on transactional, investment and energy matters in Mexico and abroad.

M INSAN PRATAMA

Assegaf Hamzah & Partners

Insan Pratama is a senior associate at Assegaf Hamzah & Partners (AHP). For the six years prior to joining AHP, he worked as an in-house counsel for the largest oil and gas company in the world. With his extensive experience in the areas of upstream, downstream, and midstream LNG, he has developed not only a breadth of knowledge of oil and gas regulatory regimes, but also a deep-rooted understanding of their commercial context and industry drivers. As an active member of the Association of International Petroleum Negotiators (AIPN) with a network of contacts in the oil and gas industry and within regulatory bodies such as SKK Migas and Migas, he continues to expand his knowledge of the development of oil and gas law and its related complex transactions.

Insan earned his LLM in business and taxation law from the University of Cergy-Pontoise, France with the support of the scholarship programme of French oil and gas giant Total SA, following his two bachelor's degrees, one in law from the Islamic University of Indonesia and one in international relations from Gadjah Mada University. He passed the bar exam of the Indonesian Bar Association (PERADI) in 2014.

Insan is currently a member of the AHP banking, finance and project team, and deals with project finance for geothermal power plant projects, as well as providing legal services for several oil and gas clients.

VICTOR SAMUEL

Detail Commercial Solicitors

Victor Samuel is a solicitor at Detail and a member of the firm's power practice. Victor is a skilled transactional lawyer with valuable experience in the Nigerian power sector. His transactional experience includes advising the Nigerian Energy Support Programme, commissioned by the German government, on the facilitation and implementation of mini-grid projects across various states in Nigeria by assisting with designing and implementing mini-grid tenders, and unlocking access to finance for the mini-grid projects; advising CrossBoundary Energy, a fund dedicated to commercial and industrial solar installations in African enterprises, on its entry into the Nigerian energy market to finance, install, own and operate solar projects; advising Waltersmith Petroman Oil Limited on the development of a 300MW power plant; and advising Consolidated Infrastructure Group Ltd on the due diligence and project structuring for its investment in the development of an 8.5MW dual-fuel power project. Victor holds a law degree from Enugu State University of Science and Technology (2012) and was called to the Nigerian Bar in 2013.

THEODORA P SAPUTRI

Assegaf Hamzah & Partners

Theodora P Saputri is an associate at Assegaf Hamzah & Partners (AHP). Theodora joined AHP as an intern in 2010 and was made a junior associate in 2011. Theodora received her Master of Laws from Leiden University in the Netherlands. She was awarded a full scholarship from the Indonesia Endowment Fund for Education (LPDP).

During her time at AHP, Theodora has been involved in a broad spectrum of mandates, including on several public–private partnership projects, construction projects and project finance matters. She teaches property law, corporate law and international contract law at her alma mater, the law faculty of Parahyangan Catholic University.

KANYA SATWIKA

Assegaf Hamzah & Partners

Kanya Satwika is a partner at Assegaf Hamzah & Partners (AHP) and has been recommended for projects and energy by *The Legal 500 Asia Pacific*. She was made a partner at AHP in 2015 and now heads the projects group in the firm's banking and finance department. She has been involved in several of the power-plant projects being developed as part of the Indonesian government's power-sector expansion programme, while also playing a leading role in a number of renewable energy initiatives. She has also been recognised internationally by *International Financial Law Review* (*IFLR*) for her expertise in M&A and Islamic finance and she advised the government of Indonesia on the country's first sovereign global Islamic bond in 2009 and its subsequent issuance in 2011, 2013 and 2015.

A licensed advocate, Kanya holds a Bachelor of Laws, majoring in transnational law, from the University of Indonesia, and an LLM in oil and gas law from the University of Aberdeen in Scotland. She is a member of the Indonesian Bar Association (PERADI).

HENRY T SCOTT

Milbank LLP

Henry Scott is a partner in the Los Angeles office of Milbank LLP and a member of the firm's global projects, energy and infrastructure finance group. Mr Scott's experience includes project finance, asset-based financing and general corporate work. He has experience representing both financing parties and sponsors in debt and equity financing transactions involving wind, solar and geothermal generation projects, coal gasification facilities and onshore LNG terminals, as well as rail and road PPP infrastructure projects. He regularly advises buyers and sellers in the acquisitions, workouts and dispositions of energy and infrastructure assets.

TONG KEUN SEOL

Lee & Ko

Tong Keun Seol is a partner at Lee & Ko. His practice primarily focuses on environment and general corporate matters involving commercial law and labour issues. Since joining Lee & Ko in 2010, Mr Seol has successfully represented clients in numerous civil, administrative and labour litigations. He is a former Secretary of the Special Environment Conservation Committee of the Seoul Bar Association and his in-depth experience in environmental matters covers all aspects of climate change, including emission trading, clean development mechanism (CDM) and renewable energy projects. Mr Seol has also advised and represented a number of CDM projects and disputes in the distribution of certified emission reductions (CERs). Mr Seol has been selected by *Who's Who Legal* as a leading lawyer in the field of the environment for the years 2017–2019, and he is highly renowned for his feasible and business-friendly solutions and his deep insight into the newly developed and emerging areas of environmental issues. Mr Seol received his LLB degree from the Korea University school of law in 1993 and was admitted to the Korean Bar in 2001.

TRACY TANIA

Assegaf Hamzah & Partners

Tracy Tania is a senior associate at Assegaf Hamzah & Partners (AHP). She has naturally gravitated towards banking and finance and project finance since commencing her practice at AHP – areas of the law that provide her with the sort of challenges she relishes. She has been involved in significant projects, including the 8.8 trillion rupiah syndicated financing for PT Lintas Marga Sedaya, holder of the Cikampek–Palimanan toll road concession, a US$2.5 billion notes offering by the government of Indonesia, and several other financings for power project companies – most recently the US$147.5 million financing for the development of the Hasang hydroelectric power plant project.

Tracy has an outstanding academic record and holds a Bachelor of Laws from the University of Indonesia and a graduate degree from New York University, United States.

NORIFUMI TAKEUCHI

Anderson Mōri & Tomotsune

Norifumi Takeuchi has been engaged in an extensive range of legal practice at Anderson Mōri & Tomotsune (AMT); in particular, assisting in significant financial transactions (including asset-based finance, syndicated loan, securitisation, capital markets and fund business), real property acquisitions and merger and acquisition deals. Mr Takeuchi is a core member and the founder of AMT's energy practice group. Mr Takeuchi has been involved as the legal adviser for both developers and lenders in many PV projects (including the 230MW solar project in Setouchi City, which is the largest PV project in Japan), wind farm projects and biomass projects. Mr Takeuchi studied at the University of Tokyo (LLB) and University of London (LLM) and is admitted to the Bar in Japan.

TANIA ELIZABETH TREJO-GÁLVEZ

Sánchez Devanny

Tania Elizabeth Trejo-Gálvez is an associate at Sánchez Devanny. Tania has more than five years of professional experience. Within the broad scope of her professional practice, Tania focuses on the analysis and preparation of different types of contracts for the energy sector (electricity and hydrocarbons). In addition, Tania provides legal advice to national and international clients on the implementation of the new regulatory framework for the energy industry in Mexico, and on the development and implementation of upstream, midstream and downstream projects, in both conventional and unconventional energies.

Tania's academic background and experience in the energy sector puts her at the forefront of practitioners with knowledge of regulatory matters regarding the entire Mexican energy value chain, allowing her to inform clients, in a timely manner, on the impact of the legal regime on current and future projects. Before joining Sánchez Devanny, Tania was with a distinguished Mexico City law firm specialising in energy law and also worked previously as a lawyer in a state productive enterprise, developing new Mexican energy industry business and projects.

RICCARDO TREMOLADA

Cleary Gottlieb Steen & Hamilton LLP

Riccardo Tremolada is an associate based in the Italian offices of Cleary Gottlieb. His practice focuses on European and Italian competition law, administrative litigation and regulation in network industries. He graduated with honours from the University of Milan (2012). He also received an LLM from Harvard Law School (Fulbright Scholar and Dean's Scholar Prize, 2018), a PhD in European Union law (University of Naples Federico II, 2017), and an SJD in international economic law (Shanghai Jiao Tong University, 2019). Prior to joining Cleary Gottlieb, Riccardo worked as a European Union Commission Marie Curie Fellow (visiting researcher) at the Chinese Research Academy of Environmental Sciences in Beijing, China. He is a member of the Milan Bar.

SHARON WING

Covington & Burling (Pty) Ltd

Sharon Wing is a corporate and project finance lawyer in Covington's Johannesburg office. She has experience in traditional and renewable energy projects, corporate transactions, and various renewable energy and mining projects across Africa.

KAREN B WONG

Milbank LLP

Karen Wong is a partner in the Los Angeles office of Milbank LLP and a member of the firm's global projects, energy and infrastructure finance group. With over 32 years of practice, Karen has spearheaded the development and financing for some of the largest thermal and renewable energy power projects in the world, including innovative concentrated solar power projects and coal gasification facilities involving carbon capture and sequestration projects, amounting to tens of billions of dollars across the United States, as well as in China, South East Asia and South America. Several of her transactions warranted 'deal-of-the-year' accolades by industry publications. Ms Wong was named 'best in energy, natural resources & mining' at the 2018 Euromoney Legal Media Group Americas Women in Business Law Awards, and was also named in the inaugural Women's Power List, published in 2017 by wind industry intelligence service A Word About Wind, and in subsequent lists, and is a well-recognised specialist in the renewable energy sector. She has been selected as one of the *Daily Journal*'s 'Top 25 Clean Tech Lawyers' in California, featured as one of the state's 'Top 75 Women Lawyers' and was included in *Institutional Investor*'s 'Guide to the World's Leading Project Finance Lawyers'. She is ranked by the 2019 edition of *Chambers Global* and *Chambers USA* for projects, *IFLR1000* and *Who's Who Legal: Project Finance*; was listed in *PLC Which lawyer?*; and is listed in both *Expert Guides: Project Finance* and *Expert Guides: Women in Business Law*.

Appendix 2

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