THE RENEWABLE ENERGY LAW REVIEW

Third Edition

Editor
Karen B Wong

THE LAWREVIEWS

THE

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Karen B Wong

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Tom Barnes

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PREFACE

When the first edition of *The Renewable Energy Law Review* launched in 2018, renewable energy made up approximately 26.2 per cent of electric generation globally and has increased to nearly 28 per cent in the first quarter of 2020. Similarly to the renewable energy sector, which has grown steadily, this compendium has also grown and now covers 19 jurisdictions in this third edition.

The renewable energy industry at the time I worked on my first transaction in 1987 was nascent and relatively tiny when compared to the conventional power industry. Fast forward 33 years and, in 2020, it is projected that renewable energy will comprise 80 per cent of the new energy capacity in the United States. According to statistics published by Smart Energy International, renewable energy projects accounted for 176GW of energy capacity globally and over 70 per cent of new capacity globally in 2019, with wind and solar projects accounting for 90 per cent of that new capacity.

Since the 'early days' of renewable energy projects, it has been incredibly satisfying to see the exponential worldwide growth that has taken place over the past several decades. 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 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 or in a particular country, I hope that this guide will aid you in your efforts as a participant in an exciting and continually expanding industry.

Karen B Wong
Milbank LLP
Los Angeles
July 2020

Chapter 19

UNITED STATES

Karen B Wong, Henry T Scott and Christopher S Bloom[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 increased from 747TWh in 2018 to 760TWh in 2019;[2] 9,137MW of wind energy capacity and 13.3GW of solar energy capacity (including approximately 8.4GW of utility-scale solar installations) were installed in 2019.[3] A record amount of wind capacity (approximately 24,690MW) was under construction at the end of the first quarter of 2020 with another 19,751MW in advanced development. The

1 Karen B Wong and Henry T Scott are partners and Christopher S Bloom is a senior associate at Milbank LLP.

2 See Bloomberg Finance LP and the Business Council for Sustainable Energy, '2020 Sustainable Energy in America Factbook', 12 (2020).

3 See American Wind Energy Association, 'Wind Powers America Annual Report 2019: Executive Summary', 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/amr2019_executivesummary. See the Solar Energy Industries Association website: https://www.seia.org/research-resources/solar-market-insight-report-2019-year-review/.

combined 44,441MW represents a 14 per cent year-on-year increase.[4] For solar, more than 14GW of capacity are expected to be installed in 2020.[5] 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.[6] While this construction continues the trend of increasing renewable generation capacity, the effects of the covid-19 outbreak on the timeline for completion of the construction expected in 2020 remains to be seen.

This growth has been propelled by extended federal incentives, advances in green technology and congenial state policies. As at April 2020, 30 states, three territories and the District of Columbia have enacted mandatory Renewable Portfolio Standards (RPSs), while seven other states and Guam have voluntary renewable energy standards or targets.[7] Hawaii and California were the first states to adopt an RPS that mandates that its electric utility companies acquire 100 per cent of their net electricity sales from renewable energy[8] and since the beginning of 2019, five additional states, the District of Columbia and Puerto Rico have all adopted an RPS mandating 100 per cent renewable energy. Maine's RPS requires utilities to derive 80 per cent of their energy from renewable energy by the start of 2030 and 100 per cent by the start of 2050.[9] New Mexico adopted an RPS that requires public utilities (other than rural electric cooperatives) to achieve 40 per cent of retail sales from renewable energy by the start of 2025, 50 per cent by the start of 2030, 80 per cent by the start of 2040 and 100 per cent by the start of 2045. For rural electric cooperatives in New Mexico, the standards are the same, except that 80 per cent of retail sales from renewable energy does not need to be achieved until the start of 2050.[10] Washington's RPS requires that all retail sales of electricity be carbon-neutral by the start of 2030, and that all such sales be from renewable energy resources by the start of 2045.[11] New York's RPS requires that 70 per cent of retail electric sales must be from renewable energy in 2030 and 100 per cent of all retail sales of electricity must be carbon-neutral in 2040.[12] And Virginia, which passed its bill in 2020,

4 See American Wind Energy Association, 'U.S. Wind Industry First Quarter 2020 Market Report: Public Version', available at the American Wind Energy Association website, https://www.awea.org/resources/publications-and-reports/market-reports/2020-u-s-wind-industry-market-reports-(1)/q12020_public.

5 See the Solar Energy Industries Association website: https://www.seia.org/research-resources/solar-market-insight-report-2019-year-review.

6 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.

7 See State Renewable Portfolio Standards and Goals, prepared by the National Conference of State Legislatures, available at: https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx.

8 See Updated renewable portfolio standards will lead to more renewable electricity generation, prepared by US Energy Information Administration, 27 February 2019, available at: https://www.eia.gov/todayinenergy/detail.php?id=38492.

9 See Me. Rev. Stat. Ann. 35-A §3210 et seq.; Me. Rev. Stat. Ann. 35-A §3401 et seq. (wind energy); Senate File 457 (2019).

10 See N.M. Stat. Ann. §62-15; N.M. Stat. Ann. §62-16; Senate Bill 489 (2019).

11 See Wash. Rev. Code §19.285; Wash. Admin. Code §480-109; Wash Admin. Code §194-37; Senate Bill 5116 (2019).

12 See NY PSC Order Case 03-E-0188; 2015 New York State Energy Plan; Senate Bill 6599 (2019).

requires that 100 per cent of all retail sales of electricity by Dominion Energy Virginia be from renewable energy by the start of 2045 and 100 per cent of all retail sales of electricity by Appalachian Power be from renewable energy by the start of 2050.[13]

Renewable energy projects in the United States continued to rely on the federal production tax credit (PTC) and investment tax credit (ITC) in 2019. Under the Protecting Americans from Tax Hikes Act of 2015, the PTC was extended through 2019 for eligible wind projects and the ITC was extended through 2021 for eligible solar projects.[14] In 2019, the PTC was extended until the end of 2020 under the Further Consolidated Appropriations Act of 2019.[15] The covid-19 outbreak has the potential to disrupt the construction timeline for wind and solar projects, which could prevent certain projects from meeting the 'begun-construction' deadline for the 26 per cent depreciation value for the ITC for solar and placed-in-service deadline for full value of the PTC for wind. Additionally, because of potential losses in revenue that could be incurred by tax equity investors as a result of the covid-19 outbreak, some of the PTCs generated in 2020 may become unusable. As a result, trade groups for the renewable energy industry have sought two potential changes to the credits: (1) 'direct pay' of tax credits from the federal government to tax equity investors whose credits exceed their tax liability in 2020; and (2) a one-year extension of the ITC and PTC deadlines for the values that would have expired in 2020.[16] On 23 April 2020, a bipartisan group of six US senators submitted a letter to the US Department of the Treasury (USDT), seeking an extension to the begun-construction continuity safe harbour. In response, the USDT issued a letter on 7 May 2020 indicating that it will modify the relevant rules in the near future to extend the continuity safe harbour, but this action has not yet been taken.[17] Extending the continuity safe harbour from four years to five years will help lessen the impact from the supply chain disruptions and force majeure delays attributable to the global coronavirus pandemic. Unfortunately, there is no statutory deadline by which the USDT must act and, while the extension appears reasonably certain, there has been no timeline announced for when the extension will be granted, given the need to coordinate with the Internal Revenue Service (IRS).

Buoyed by state mandates and favourable IRS rulings regarding the applicability of the ITC, 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.[18] 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

13 See Va. Code §56-585.2; Senate Bill 851 (2020).

14 Pub. L. No. 114-113, Div. Q, 129 Stat. 2242 (2015).

15 Pub. L. No. 116-94, Div. Q, 133 Stat. 2534 (2019).

16 See Jeff St John, 'Solar, Wind and Storage Industries Seek Relief in Coronavirus Stimulus Package', Greentech Media, 19 March 2020, available at: https://www.greentechmedia.com/articles/read/clean-energy-groups-seek-tax-credit-extensions-direct-pay-provisions-in-coronavirus-stimulus-package.

17 See Emma Foehringer Merchant, 'US Treasury to Tweak Tax Credit Deadlines for Renewables Projects', Greentech Media, 7 May 2020, available at: https://www.greentechmedia.com/articles/read/treasury-department-to-tweak-tax-credit-deadlines-offering-renewables-relief.

18 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.

'duck curve').[19] Energy storage capacity increased by 523MW in 2019, with approximately 1,452MW of capacity expected to be installed in 2020.[20] A number of utilities have sought to expand their energy storage capacity, with PacifiCorp,[21] Southern California Edison[22] and Dominion Energy Virginia[23] all announcing energy storage contracted capacity or expected requests for proposals in late 2019 and early 2020.

Since the successful completion and commercial operation of the 30MW Block Island Wind Farm, 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 Association, represents a potential for more than 2,000GW of energy.[24] The state policies adopted by Connecticut, Maryland, Massachusetts, New Jersey, New York, Rhode Island and Virginia 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 spur the development of an American supply chain for the industry and could lead to the installation of 86GW of offshore wind projects by 2050, according to the Department of Energy.[25] The Bureau of Ocean Energy Management (BOEM) notes that there are 15 active leases for offshore wind projects and others may be forthcoming.[26] Construction of utility-scale offshore wind development has been delayed because of the BOEM's extended review of an environmental impact statement for the approximately 800MW Vineyard Wind project being jointly developed by Iberdrola's affiliate Avangrid Inc, and Copenhagen Infrastructure Partners, which at the time of the delay, was the US project that was furthest along in development.[27] Given the extended review, the Vineyard Wind project is not expected to reach commercial operation until 2023 at the earliest.[28]

Advances in technology have also led to a decline in wholesale power prices. The developments in hydraulic fracturing and the increased use of the practice in the US created

19 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.

20 See Wood Mackenzie Power & Renewables, 'U.S. Energy Storage Monitor 2019 Year in Review: Executive Summary', available at the Wood Mackenzie Power & Renewables website https://www.woodmac.com/research/products/power-and-renewables/us-energy-storage-monitor/.

21 See 'PacifiCorp draft resource plan calls for increases in lower-cost wind, solar and storage to manage phased coal transition', PacifiCorp, 3 October 2019, available at: https://www.pacificorp.com/about/newsroom/news-releases/2019-draft-irp-increased-renewables-phased-coal-transition.html.

22 See 'SCE Grows Clean Energy Portfolio, Enhances System Reliability With 770 Megawatts of New Energy Storage Capacity', Edison International, 1 May 2020, available at: https://newsroom.edison.com/releases/sce-grows-clean-energy-portfolio-enhances-system-reliability-with-770-megawatts-of-new-energy-storage-capacity.

23 See 'Dominion Energy Virginia Quadruples Renewable Energy and Energy Storage in Long-Term Integrated Resource Plan', Dominion Energy, 1 May 2020, available at: https://news.dominionenergy.com/2020-05-01-Dominion-Energy-Virginia-Quadruples-Renewable-Energy-and-Energy-Storage-in-Long-Term-Integrated-Resource-Plan.

24 See AWEA website, https://www.awea.org/policy-and-issues/u-s-offshore-wind.

25 See AWEA website, https://www.awea.org/Awea/media/Resources/Fact%20Sheets/Offshore-Fact-Sheet.pdf.

26 id.

27 See Karl-Erik Stromsta, 'Two Months Later, Vineyard Wind's Delay Still Clouds US Offshore Picture', Greentech Media, 23 October 2019, available at: https://www.greentechmedia.com/articles/read/vineyard-wind-delay-still-clouds-us-offshore-market.

28 See Karl-Erik Stromsta, 'Vineyard Wind's Permitting On Track Despite Coronavirus, BOEM Says', Greentech Media, 21 April 2020, available at: https://www.greentechmedia.com/articles/read/vineyard-winds-permitting-on-track-despite-coronavirus-boem.

a glut of available natural gas, resulting in lower natural gas prices, which in turn was the dominant driver in causing the decrease in average annual wholesale prices between 2008 and 2017.[29] Continuing this trend, 2019 saw a year-on-year decrease in wholesale prices on average in every market except the Electric Reliability Council of Texas (ERCOT) and the Northwest electric power market.[30] Developments in technology and economies of scale in the wind and solar sectors have allowed both industries to reduce construction and installation costs and keep pace with the decrease in wholesale power prices.[31] The lowered wholesale prices have attracted corporate buyers and other non-utility purchasers to the market who are seeking fixed, low-cost energy.[32]

Spurred by low prices, and supported by public goals for corporate social responsibility and sustainability, an ever-growing list of the world's most influential companies have committed to sourcing 100 per cent renewable power, with institutions such as computer manufacturer Dell, investment bank Macquarie and fashion brand Ralph Lauren among the most recent companies to announce such a commitment.[33] Indeed, large companies are driving demand for renewable energy: American corporations signed a record 13.6GW of power purchase agreements for renewable energy in 2019, with Google as the largest offtaker, signing contracts for 1,720MW.[34]

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;[35] the wind and solar sectors are poised to help states meet the proposed compliance plans.[36] The final rules were released in August 2015 (the Clean Power Plan) but faced immediate legal challenges from a large

29 See Andrew D Mills et al., 'Impact of Wind, Solar, and Other Factors on Wholesale Power Prices: An Historical Analysis – 2008–2017', Lawrence Berkeley National Laboratory 47 (November 2019).

30 See Bloomberg Finance LP and the Business Council for Sustainable Energy, '2020 Sustainable Energy in America Factbook', 26 (2020).

31 Installed prices for utility-scale solar projects have declined every year from 2010 to 2018, with a 70 per cent overall decline in the median installed price. See Mark Bolinger, Joachim Seel and Dana Robson, 'Utility-Scale Solar – Empirical Trends in Project Technology, Cost, Performance and PPA pricing in the United States – 2019 Edition', Lawrence Berkeley National Laboratory 19 (December 2019). Global wind turbine prices have fallen 58 per cent since 2009. See Bloomberg Finance LP and the Business Council for Sustainable Energy, '2020 Sustainable Energy in America Factbook', 70 (2020).

32 id., at 67.

33 See the RE100 website: http://there100.org/news/14292038.

34 See Bloomberg Finance LP and the Business Council for Sustainable Energy, '2020 Sustainable Energy in America Factbook', 43 (2020).

35 See the US Environmental Protection Agency website: https://www.epa.gov/cleanpowerplan/clean-power-plan-existing-power-plants.

36 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.

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.[37] On 16 October 2017, the EPA proposed the repeal of the Clean Power Plan[38] and published the proposed repeal rule, known as the Affordable Clean Energy (ACE) rule, on 31 August 2018.[39] The EPA's final repeal rule was published on 8 July 2019, and went into effect on 6 September 2019.[40]

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 ERCOT, which occupies most of central Texas and is not synchronously 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

37 See the Environmental Defense Fund website: https://www.edf.org/sites/default/files/content/2019.04.05%20Order%20Continuing%20Abeyance.pdf.

38 82 FR 48035 (16 October 2017).

39 83 FR 44746 (31 August 2018).

40 84 FR 32520 (8 July 2019).

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.[41] 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.[42]

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.[43] 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.

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

41 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.

42 This last factor was added by the US Congress pursuant to the Energy Policy Act of 2005.

43 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.

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.[44] 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.[45] 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.[46] As at April 2019, 48 states and the District of Columbia compensated customers for distributed energy, although rates and prices varied greatly.[47]

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.[48] 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.[49] For states imposing lower rates for energy produced by distributed generation installations,

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44 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.

45 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.

46 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).

47 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.

48 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).

49 id., at 47.

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.[50] 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.[51] 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.[52] 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[53] and Tucson Electric Power's Bright Tucson[54] 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[55] or the 30 per cent ITC[56] 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 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

50 id.

51 id., at 48.

52 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.

53 See Sacramento Municipal Utility District, *Power Sources*, https://www.smud.org/en/Corporate/Environmental-Leadership/Power-Sources.

54 See Tucson Electric Power, *Bright Tucson Community Solar*, https://www.tep.com/community-solar/.

55 Section 45 of the Internal Revenue Code of 1986, as amended.

56 Section 48 of the Internal Revenue Code of 1986, as amended.

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.[57] 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.[58] 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.[59]

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,[60] but the imposition of these tariffs did not appear to slow down development of solar projects, with 8.4GW of utility solar projects installed in 2019 and 30.6GW of new power purchase agreements signed or announced.[61] Despite the increase in solar expansion, industry groups have projected that the tariffs have actually resulted in a reduction of installations in 2019 of approximately 1.3GW.[62]

Additionally, the Trump administration recently issued an executive order prohibiting US companies from acquiring, importing, transferring or installing any bulk-power system electric equipment that (1) is designed, developed, manufactured or supplied by a person

57 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).

58 id.

59 id.

60 International Trade Commission and Bloomberg New Energy Finance (2017) in Chris Martin, Jim Efstathiou and Ari 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.

61 See the Solar Energy Industries Association website: https://www.seia.org/research-resources/solar-market-insight-report-2019-year-review/.

62 See 'The Adverse Impact of Section 201 Tariffs: Lost Jobs, Lost Deployment and Lost Investments', prepared by Solar Energy Industries Association, 3 December 2019, available at: https://www.seia.org/sites/default/files/2019-12/SEIA-Tariff-Analysis-Report-2019-12-3-Digital_0.pdf.

that is owned, controlled or subject to the jurisdiction or direction of a foreign adversary, or (2) poses an undue risk of sabotage, subversion or catastrophic effects of or on the bulk-power system, critical infrastructure or economy of the United States or poses an unacceptable risk to the national security of the United States.[63] While the executive order calls for further rule-making from the Department of Energy, the order itself enacts a vague and broad prohibition on the use of equipment from foreign countries without providing details of what countries are considered foreign adversaries,[64] what specific equipment violates the order or what penalties will be imposed for violations.[65] Initial proposed rules are expected by the end of September 2020.[66] Given the role of many foreign companies in supplying equipment for US renewable energy projects, the development and application of these regulations could have a substantial effect on the supply chain for such projects.[67]

Despite energy policy shifts away from renewable energy sources, renewable wind and solar energy reached 10 per cent of total electrical generation in 2019 in the United States.[68] 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 dropped dramatically, with wind turbine technology exports growing from US$16 million in 2007 to more than US$100 million annually.[69]

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.[70] In fact, EVs could create up to 774TWh of electricity demand (on par with the entire US industrial sector);[71] electricity demand from all types of EVs (including

63 See 'Executive Order on Securing the United States Bulk-Power System', 1 May 2020, available at: https://www.whitehouse.gov/presidential-actions/executive-order-securing-united-states-bulk-power-system/.

64 A 2019 report from the Director of National Intelligence named both China and Russia as global threats, with the capability of interrupting critical infrastructure, including the electrical grid. See Daniel Coats, 'Worldwide Threat Assessment of the US Intelligence Community', 29, January 2019, available at: https://www.dni.gov/files/ODNI/documents/2019-ATA-SFR---SSCI.pdf.

65 In December 2019, a bipartisan group of US Senators sent a letter to FERC, urging FERC to consider a ban on inverters from Huawei Technologies Co., a Chinese solar manufacturing company. See Chris Mill Rodrigo, ' Bipartisan senators call on FERC to protect against Huawei threats', The Hill (6 December 2019), available at: https://thehill.com/policy/technology/473383-bipartisan-senators-call-on-ferc-to-protect-against-threats-from-huawei.

66 See 'Executive Order on Securing the United States Bulk-Power System', 1 May 2020, available at: https://www.whitehouse.gov/presidential-actions/executive-order-securing-united-states-bulk-power-system/.

67 Stephen Cunningham and Ari Natter, 'Trump Looks to Secure U.S. Power Grid From Foreign Attacks', Bloomberg (1 May 2020), available at: https://www.bloomberg.com/news/articles/2020-05-01/trump-looks-to-secure-u-s-power-grid-from-foreign-attacks.

68 US Energy Information Administration, 'Short-Term Energy Outlook', January 2020, available at: https://www.eia.gov/outlooks/steo/archives/jan20.pdf.

69 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.

70 See Electric Vehicle Outlook 2019, Bloomberg New Energy Finance (2019).

71 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.

passenger EVs, commercial EVs and e-buses) is projected to rise from 74TWh in 2019 to 1,964 TWh by 2040.[72] 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 aimed at having consumers charge EV batteries with energy from renewable sources (e.g., policies that determine charging station locations and time-of-use rates for electricity) would do well to track this relationship.

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.[73] Moreover, there have been noteworthy developments in the US offshore wind energy sector due to technological improvements and governmental support at the state level.[74]

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,[75] such as time-of-use rates, to support the influx in demand and prevent displaced fossil fuels from being replaced by dirty 'peaker' plants.[76] The marriage of renewable energy and the electrification of transportation will be supported by the country's increased funding for

72 See Electric Vehicle Outlook 2020, Bloomberg New Energy Finance (2020).

73 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).

74 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).

75 See Keith Dennis, Ken Colburn and Jim Lazar, *Environmentally Beneficial Electrification: The Dawn of 'Emissions Efficiency'*, The Electricity Journal, Vol. 29 Issue 6 (2016).

76 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).

electric transportation research[77] and states' growing RPSs.[78] 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.

77 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.

78 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/.

Appendix 1

ABOUT THE AUTHORS

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 33 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*.

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.

CHRISTOPHER S BLOOM

Milbank LLP

Chris Bloom is a senior associate in the Los Angeles office of Milbank LLP and a member of the firm's global projects, energy and infrastructure finance group. Mr Bloom represents developers, investors and lenders in the development and financing of utility-scale energy projects, with a particular focus on renewables. He also has experience in negotiating residential solar and commercial and industrial solar portfolio transactions, as well as energy-specific and general corporate mergers and acquisitions.

MILBANK LLP

2029 Century Park East
33rd Floor
Los Angeles, CA 90067
United States
Tel: +1 424 386 4000
Fax: +1 213 629 5063
kwong@milbank.com
hscott@milbank.com
csbloom@milbank.com
www.milbank.com

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