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Corporate Renewable Energy Procurement – Mechanisms and Trends

2018 was a record-setting year for corporate renewable procurement, and expectations are that these upward trends will continue in 2019 and beyond. As renewable energy prices continue to fall and corporate sustainability goals become increasingly important to businesses, a greater number of corporate actors are looking to purchase renewable energy to meet voluntary targets, reduce energy costs, and reduce their exposure to variable energy prices. An estimated 6.53 gigawatts (GW) of corporate power purchase agreements were signed in 2018 in the United States, more than double the next record setting year of 2015 and reaching over 15 GW cumulatively in corporate renewable PPAs since 2013.[1] Renewable energy procurement historically focused on the environmental attributes of renewable generation, but corporate actors are now utilizing additional mechanisms to purchase the renewable energy through direct access programs. Utilities, competitive service providers, and renewable energy developers have created a variety of procurement instruments to meet this increasing corporate demand. Additionally, there is increasing diversity in the type of corporate actors that are signing renewable energy procurement deals. This issue brief explores the possible mechanisms for corporate renewable power procurement, the major corporate players and coalition advocates, and the state and utility policy trends that are supporting this expansion. This issue brief has been updated to include data from the National Renewable Energy Laboratory (NREL) on market trends in renewable energy procurement in 2018 for a number of the procurement mechanisms detailed below.

Renewable Energy Procurement Mechanisms

Companies interested in procuring renewable energy in order to meet some or all of their corporate electricity needs have a number of procurement mechanisms available, as described below. The trend among corporations over the last decade has been away from purchasing renewable energy certificates (RECs) toward more direct renewable energy procurement, either through direct or virtual PPAs or direct deployment of renewable resources. However, unbundled RECs remain the most popular voluntary procurement mechanism by overall electricity sales market wide (i.e., including residential and other non-corporate purchasers).

Renewable Energy Certificates

A renewable energy credit, or REC, represents the environmental attributes associated with one megawatt-hour (MWh) of renewable generation. Under state renewable portfolio standards, regulated entities must hold RECs equivalent to a specified amount of electricity, frequently represented as a percent of delivered electricity. These RECs can be procured either in conjunction with the associated electricity (called a "bundled" transaction) or separated from the electricity. When separated, these are known as unbundled RECs, representing a transaction in which the environmental attributes are separated and sold/purchased independently from the actual energy. While RECs are critical in tracking compliance with portfolio standards, they also can be purchased by entities outside of

[1] Rocky Mountain Institute, "Corporate Renewable Energy Procurement Continues to Break records in 2018," (December 18,2018). https://rmi.org/press-release/corporate-renewable-energy-procurement-continues-to-break-records-in-2018/.

the compliance markets as a way to own the environmental attributes of generated electricity. A company may be interested in purchasing unbundled RECs when it wishes to claim the environmental benefit of the renewable energy project but does not or cannot take possession of the energy. In addition, many REC transactions allow for buyers to specify the type of renewable energy they wish to purchase (e.g., Texas wind).

Example: Microsoft's RECs Purchases from Black Hills Corporation

Microsoft was one of the earliest and largest corporate procurers of renewable energy. Through sustainable investments and renewable purchasing, 100 percent of Microsoft's energy consumption has been credited to renewable energy since 2014. For example, in the fall of 2016, Microsoft agreed to purchase 59 MW of RECs to cover the annual energy consumption associated with the expansion of a data center in Cheyenne, Wyoming. The RECs are generated by nearby wind farms owned by the local utility, Black Hills Corporation. As a separate part of the agreement predicated by the REC purchase negotiations, Black Hills agreed to pay Microsoft for access to its back-up generators to meet projected peak energy demand.

Source: AEE Webinar, Innovations in Corporate Renewable Energy Procurement, May 24, 2017

Standard Power Purchase Agreement

A standard or direct power purchase agreement (PPA) is an agreement between an energy developer or generator and an end user. The purchaser agrees to pay the developer a fixed rate for the electricity generated under a multi-year contract, often between 10 to 20 years. The off-taker, which could be a corporation or other party, takes legal title to both the electricity and REC. Typically, in order to be able to take title to the energy, an interested purchaser must be located in the same grid region in which the renewable energy project is located, and the state in which the purchaser is located must participate in a competitive electricity market. States that do not participate in a competitive electricity market and instead have only vertically-integrated utilities do not allow electricity sales from an energy producer other than from the electric utility provider.

Virtual Power Purchase Agreement

A virtual or synthetic/financial PPA provides more flexibility to companies interested in pursuing renewable energy procurement, particularly if the purchaser is not located in a competitive market, because no physical renewable electricity is necessarily delivered to a corporate off-taker. The project may also be located outside of the purchaser's electricity market. Virtual PPAs are usually considered swaps or derivatives (exchanges settled financially rather than physically), and therefore, can be subject to additional regulations by the Commodity Futures Trading Commission (CFTC). The renewable energy is sold directly into the power grid in which it is located, receiving the market price for electricity. The off-taker does not take legal title of the electricity but receives the RECs at a fixed price in a separate transaction. The renewable energy developer passes the difference between the wholesale price and the fixed PPA price on to the off-taker if the wholesale power price is higher than the negotiated fixed price; when the wholesale electric power price is less than the negotiated fixed price the corporate off-taker pays the

Example: Cargill Announce Virtual Power Purchase Agreement in South Dakota

In October 2018, Cargill announced a Virtual PPA with Geronimo Energy in which Cargill bought 50 MW of wind power from Geronimo Energy's 200 MW Crocker Wind Farm project in Clark County, South Dakota. Cargill committed to reduce emissions from the company's operations by 10 percent by 2025, relative to a 2017 baseline. This project helps deliver approximately 10 percent of those emissions reductions. Cargill agreed to purchase power through the Virtual PPA for 12 years with Geronimo Energy owning and operating the wind energy resource. Cargill's Virtual PPA provides a predictable revenue stream to support renewable energy development and has allowed the project to reduce its costs of financing. Walmart has signed a related Virtual PPA for the remaining 150 MW of Geronimo's Crocker project.

Source: Cargill Press Release, October 18, 2018

renewable energy developer the difference. The financial benefit of a virtual PPA is dependent upon the difference between the floating wholesale market price and the negotiated fixed price.

Utility Green Tariffs

In order to meet increasing demand by corporate customers for renewable energy, utilities have begun to offer optional tariff programs that provide RECs from a portfolio of projects or a specific project to corporate off-takers. This provides companies located in regulated markets an opportunity to purchase renewable energy in order to meet corporate sustainability goals while also reducing potential long-term electricity price volatility. With a utility green tariff program, a utility provides customers the option of procuring up to 100 percent of its power needs with renewable energy. This energy is then sourced from a range of sources. Depending on the utility program, it may include new or existing projects; projects located within a certain geographic area such as the utility service area or a state; projects that are owned by the utility or contracted with a third-party power provider; or even unbundled RECs (sometimes referred to as utility green pricing programs). Some utilities offer "sleeved" PPA tariffs, in which a company pays for an offsite PPA through their utility bill that includes both the PPA and utility service costs. Utilities may offer customers a market-based rate (MBR) offering, pegging a customer's electric rate to the wholesale power market rate. Market-based rate schedules can be applied as a tariff, allowing companies to access wholesale market pricing while remaining a utility customer. This option enables companies to pursue a virtual PPA model, facilitated by the utility, in a regulated utility territory. Utility green tariff programs typically include provisions to ensure that project risks and costs are not shifted onto non-participating utility customer and only charges utility customers for the total amount of renewable electricity used.

Example: General Motors and Switch First to Participate in Consumers Energy Green Tariff Program

General Motors and Switch, a data center and technology company, announced in 2018 that they were matching 100 percent of their company's electricity use at their Michigan facilities with wind-generation from the Cross Winds Energy Park II in Tuscola County, Michigan. Consumer Energy's green tariff for large customers was approved by the Michigan Public Service Commission in 2017. General Motors' two plants in Flint are now powered entirely by roughly 110,000 MWh a year of wind energy. Switch's 1.8 million-square-foot data center in Grand Rapids is also powered exclusively through wind energy contracted through Consumers Energy.

Source: PR Newswire, March 8, 2018

Competitive Suppliers

In addition to the mechanisms described above, corporate actors that are located in states with retail choice and interested in procuring renewable energy may be able to purchase energy from a third-party provider that is not their distribution utility. Companies no longer receive electricity from the utility (they "exit" utility service) but rather source it from alternative energy suppliers. These alternative providers often provide customers with options to receive a larger portion of their energy from renewable sources than they would receive from typical utility service.

Example: MGM Grand and Wynn Resorts Leave NV Energy

MGM Grand and Wynn Resorts in Nevada recently exited NV Energy to pursue lower, wholesale electricity costs and boost their renewable profiles. Although they were required to pay approximately $100 million collectively in exit fees (and will continue paying wires/demand charges), MGM expects to earn back its exit fees within seven years. MGM and Wynn plan to further invest in renewables as part of the exit, including direct ownership of renewable projects. This trend has increased over recent years with at least 10 large business petitioning the state's Public Utilities Commission for the right leave NV Energy's service in 2018.

Source: Las Vegas Sun, AP 2018

Corporate Competitive Wholesale Purchasing

A number of companies, such as Google, Apple, and Walmart, have obtained authority from the Federal Energy Regulatory Commission (FERC) to directly purchase and sell electricity on the competitive wholesale market. Companies commonly use this license to sell renewable energy they have purchased through PPAs to the retail market while retaining ownership of the RECs from the generation. A company may also develop and operate its own renewable energy assets on- or off-site. However, self-owned renewable generation is typically supplemented with grid electricity. Corporate actors that fund and install renewable facilities for onsite consumption own the corresponding RECs.

Corporate Trends

The Business Renewables Center (BRC), an initiative of the non-profit Rocky Mountain Institute that tracks corporate renewable purchasing, estimated that there have been over 15.5 GW of renewable corporate deals signed since 2013, and 2018 was a record-breaking year for corporate renewable power deals. BRC reported 75 corporate renewable deals totaling 6.53 GW for 2018, which is more than double the number of deals signed in 2017. This estimate includes publicly announced contracted renewable capacity through corporate power purchase agreements, utility green tariffs, and corporate project ownership, but excludes on-site generation such as rooftop solar. For these estimates, BRC noted that while the majority of corporate deals signed have been for wind, an increasing number of corporate purchasers are contracting for solar. Additionally, the majority of corporate renewable energy deals have been signed by large technology and telecommunications companies such as Facebook, AT&T, Microsoft, and Apple, but a growing number of industrial, retail, and manufacturing companies have signed corporate renewable energy contracts.[2] These companies include Exxon Mobile, Air Liquide, Cargill, and General Motors, among others.

A portion of the corporate renewable energy contracts were signed through utility green tariff programs. Currently, utilities in 16 states have green tariffs in place. In 2018, there was nearly 800 MW of contracted renewable energy through utility green tariffs, primarily in New Mexico, Nevada, Washington, Nebraska, and Georgia, with over 950 MW currently under negotiation. It is estimated that Facebook and Apple accounted for over one-third of the overall market for utility green tariff deals in 2018.[3]

According to the U.S. EPA Green Power Partnership, a voluntary partnership with more than 1,700 organizations committed to procuring renewable energy to meet some or all of their electricity needs, the majority of partner renewable energy contracts have been unbundled RECs, with off-site PPAs representing the second most common renewable energy contract. The Green Power Partnership notes that participating companies used roughly 55 TWh of renewable energy in 2018, with 54 percent sourced from the retail REC market, 12 percent from competitive renewable energy procurement, 15 percent from virtual or financial PPAs, 8 percent for physical PPAs, four percent from self-supply, and one percent from utility green tariff programs.[4] Figure 1 below outlines the trends in renewable power purchasing by supply option for corporate Green Power Partnership participants.

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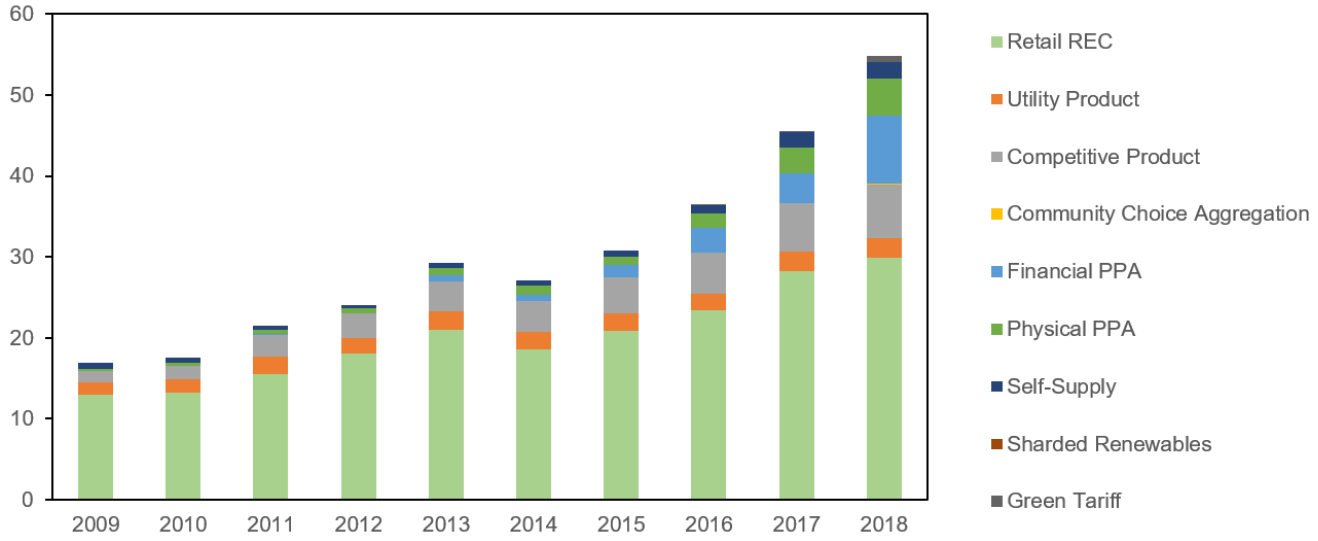
2 World Resources Institute, "Grid Transformation: Green Tariff Deals," (April 2017). https://www.wri.org/resources/charts-graphs/grid-transformation-green-tariff-deals.

3 World Resources Institute, "Grid Transformation: Green Tariff Deals," (April 2017). https://www.wri.org/resources/charts-graphs/grid-transformation-green-tariff-deals.

4 U.S. EPA, Green Power Partnership Program Success Metrics, https://www.epa.gov/greenpower/green-power-partnership-program-success-metrics.

Figure 1. Types of Corporate Renewable Procurement Under the Green Power Partnership by MWh



Source: U.S. EPA Green Power Partnership.

2018 National Renewable Energy Laboratory Voluntary Renewable Market Analysis & Trends

An National Renewable Energy Laboratory (NREL) analysis of voluntary renewable energy markets for 2018 found similar trends for corporate and residential/other voluntary renewable buyers with increased participation through various voluntary renewable energy procurement mechanisms.[5] Table 1 details the participation by total sales in MWh and by the total number of market participants in 2010 and 2018 for seven voluntary renewable energy procurement mechanisms.

Table 1: 2018 Renewable Energy Sales and Participation by Procurement Mechanism

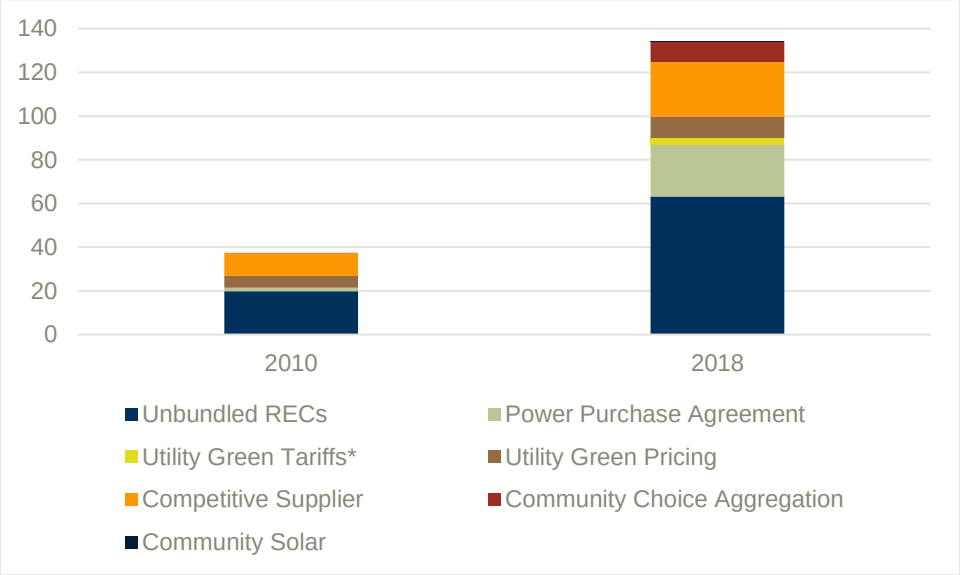
Segment	Sales in 2010 (million MWh)	Sales in 2018 (million MWh)	Participation in 2010 (x1000 customers)	Participation in 2018 (x1000 customers)
Unbundled RECs	19.8	63.2	60	209
Power Purchase Agreement	1.7	23.5	0.05	0.275
Utility Green Tariffs *	-	3.3	-	0.003
Utility Green Pricing	5.4	9.7	570	966
Competitive Supplier	10.4	25	1,200	1,735
Community Choice Aggregation	0.002	9.5	0.4	3,382
Community Solar	0	0.1	0	6

* Note: Data not available for utility green tariffs in 2010.
Source: NREL, Status and Trends in the Voluntary Market (2018 data), September 2019.

[5] NREL and Clean Kilowatts LLC, "Status and Trends in the Voluntary Market (2018 data), Presented at the Renewable Energy Markets Conference 2019, (September 4-6, 2019), available at: https://www.nrel.gov/docs/fy20osti/74862.pdf.

In total, voluntary renewable energy programs now represent three percent of overall retail electricity sales and 28 percent of non-hydroelectric renewable energy generation. These voluntary programs, therefore, continue to be an important driver in renewable energy development. NREL notes that each segment of the voluntary renewable energy market increased in 2018 and over the last eight years, albeit at varying annual growth rates. Overall participation has also increased markedly since 2010, with competitive suppliers being the most popular market mechanism by total market participation.

Figure 2: Sales in Million MWh for 2010 and 2018 by Voluntary Procurement Mechanism



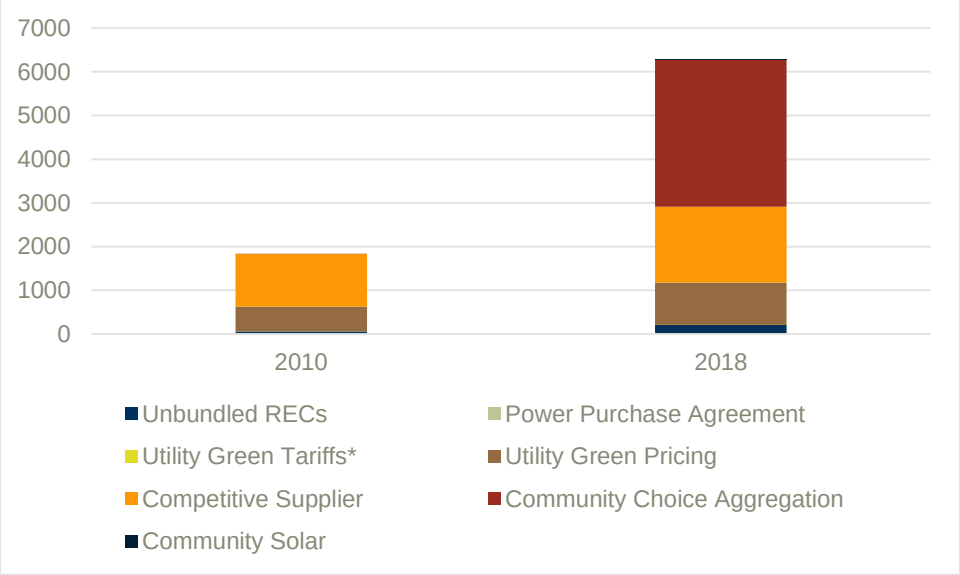
* Note: Data not available for utility green tariffs in 2010.
Source: NREL, Status and Trends in the Voluntary Market (2018 data), September 2019.

Unbundled RECs remain the largest source of renewable energy procured through voluntary market mechanisms, representing 47 percent of sales in MWh in the voluntary procurement market in 2018.[6] Unbundled REC sales increased by roughly 22 percent between 2017 and 2018, while sales since 2010 have more than tripled. The number of customers purchasing unbundled RECs has increased as well, from 60,000 in 2010 to 209,000 in 2018. Figure 3 details total customer participation by program type in 2010 and 2018.

In contrast, competitive renewable energy supplier programs in restructured electric utility markets represent the voluntary renewable procurement mechanisms with the second largest number of customers, after community choice aggregation, though total renewable energy procured falls short of that procured through RECs. NREL found that there were 1.7 million customers using competitive renewable energy supplier programs in 2018. Competitive renewable energy supplier programs have grown significantly since 2010, with total annual sales more than doubling from 10.4 million MWh to 25 million MWh in 2018, increasing 38 percent from 2017 to 2018.

[6] The total includes voluntary renewable mechanisms not included in table 1 including community choice aggregation and community solar, which combined, represent 7 percent of 2018 voluntary renewable contract sales in 2018.

Figure 3: Number of Customer Participants in 2010 and 2018 by Voluntary Procurement Mechanism (x1000)



* Note: Data not available for utility green tariffs in 2010.
Source: NREL, Status and Trends in the Voluntary Market (2018 data), September 2019.

Power purchase agreements remain another popular mechanism, especially among a small number of corporate customers who purchase large amounts of electricity. PPAs signed by large corporate off-takers and renewable energy developers represented approximately 18 percent of total voluntary renewable energy procurement in 2018, or 23.5 million MWh. In 2018, NREL found that approximately 275 purchasers were responsible for this procurement, which increased 19 percent over 2017 procurement levels.

NREL divides utility green tariffs, which allow customers to work with their utility to purchase additional renewable energy into two categories: those that include a purchase of the energy, called "Utility Green Tariffs," and those that are REC-only purchases, or "Utility Green Pricing." NREL found utility green tariffs, including both general renewable offerings and sleeved PPAs (which allow an off-taker to, working through its utility, procure electricity from a specific source; see above for more detail), represented a combined 1,940 MW of renewable energy capacity in 2018 and generated roughly 3.3 million MWh. Iowa remains the largest source for sleeved PPA contracts, while Nevada, North Carolina, and Virginia are the predominant regional markets for procurement that serves other utility green tariff programs.

Utility green pricing mechanisms (i.e., REC only purchases facilitated through the utility) constitute a much larger offering, with approximately 966,000 customers purchasing 9.7 million MWh of renewable energy in 2018. Utility green pricing programs have seen an 80 percent increase in total sales since 2010, and a 60 percent increase in the total number of customers participating in utility green pricing programs over this time.

Though not evaluated in detail in this issue brief, NREL analysis also details the increasing popularity of community choice aggregation (CCA) programs and community solar programs, especially for residential (non-corporate) purchasers. Collectively, these two voluntary renewable energy procurement mechanisms represented 9.6 million MWh in renewable energy sales in 2018, roughly seven percent of overall voluntary renewable energy program purchasing in 2018, and over 3.3 million customers.

Coalitions and Business Advocates

There are several coalitions that advocate for increased corporate renewable energy opportunities by promoting corporate renewable deals, facilitating state policy, and seeking to broaden the number and types of companies that sign renewable energy contracts. The Renewable Energy Buyers' Alliance (REBA), for example, is a collaborative effort with the World Wildlife Fund, World Resources Institute, Rocky Mountain Institute, the Business for Social Responsibility, and almost 80 companies, representing 69 million MWh of annual demand.[7]

The Rocky Mountain Institute's BRC includes 276 corporate members, ranging from information technology companies to healthcare and consumer goods, governments, municipalities, and universities, that have contracted for over 16,000 MW of renewable energy since their founding in 2015. BRC's goal is to have their corporate members procure 60 GW of renewable energy by 2030. BRC provides their members with tools and resources to facilitate corporate renewable energy deals through sharing case-studies, best-practices, and lessons learned on deal structures, and corporate and policy trends.[8]

The Advanced Energy Buyers Group is a business-led initiative sponsored by Advanced Energy Economy.[9] This group has 11 large technology, retail company, and university members, including Google, Apple, Amazon, and Target. The group works on state and utility policies that facilitate the procurement of renewable energy in order to meet their renewable energy targets.

State and Utility Policy: Support for Corporate Renewable Procurement

State level policy plays a crucial role in the ability of corporate actors to procure renewable energy. Existing state electricity market structure, including whether the market is competitive or vertically integrated, is also an important policy characteristic that can determine how companies procure renewable energy.

A suite of state policies that determine the favorability of corporate renewable procurement are those that are designed to limit or mitigate ratepayer impacts as a result of direct access for renewable energy procurement by corporate buyers. When a large electricity user exits a utility and purchases electricity themselves, the remaining customers in the rate base shrinks, which may cause the utility to increase rates for remaining customers. To mitigate this risk and provide financial protection for remaining utility customers, regulators often levy a transition charge or fee on the corporate procurer that is exiting, and these can either be a one-time or multi-year charge. For example, California has a Power Charge Indifference Adjustment (PCIA) that is levied on customers that leave a utility and procure electricity directly, while Pacific Power in Oregon charges a transition adjustment fee for five years.

For utilities that offer renewable energy contracts for corporate procurement, either through green tariffs or some other market mechanism, there are a number of policy and design considerations. Utility renewable energy procurement programs often have an initial size cap on the total amount of renewable energy that can be procured either overall or by any one corporate off-taker. Corporate purchasers may not be interested in pursuing renewable energy contracts with a utility if the size cap is too small and does not represent a sizeable portion of overall electricity demand. For example, Rocky Mountain Power's green utility tariff in Utah does not have a cap on total customers or the overall program; however, Dominion Energy in Virginia has limited its offerings to an initial fifty customers. Additionally, Georgia Power's renewable energy procurement program was limited to 200 MW overall and was oversubscribed soon after it began.

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7 Renewable Energy Buyers' Alliance, "Corporate Renewable Energy Buyers' Principles," https://buyersprinciples.org/about-us/.
8 Rocky Mountain Institute, Business Renewables Center, https://rmi.org/our-work/electricity/brc-business-renewables-center/.
9 The Advanced Energy Buyers Group, Advanced Energy Economy, https://info.aee.net/ae-buyers-group.

States with competitive energy markets and states that allow for direct access or retail choice allow corporate customers to directly procure electricity from renewable resources in the state or regional grid. However, there are often customer eligibility requirements regarding size and demand load.[10] States often limit customer eligibility based on demand. For example, Michigan allows direct access for all commercial customers, while California operates a lottery in which all non-residential customers are eligible to participate in regardless of size.[11] In other states, commercial customer eligibility for direct access programs is limited based on load or whether they are new customers. In Georgia, for example, only new commercial customers with 900 kW or more in monthly demand are eligible, while Virginia requires customers to have at least 5 MW of demand at a single site to be eligible for retail choice.

Aggregation is important feature of some state policies that allows multiple sites within the same company or even multiple companies to aggregate total electricity demand and enter into renewable energy agreements. While some utilities allow customers to aggregate demand over more than one site in their service territory in order to meet the threshold eligibility requirement, not all utilities allow that structure. For example, Consumer Energy in Michigan allows corporate customers to aggregate demand across multiple facilities to meet the 1 MW minimum necessary to participate in the renewable energy green tariff program. By comparison, the Dominion Energy renewable energy tariff requires that customers meet the minimum demand requirement on a single meter.

Another policy that affects companies' interest in procuring renewable energy is the minimum duration of contracts that are required in order to pursue certain renewable procurement options. Companies vary in their tolerance and preference for the length of renewable energy contracts, with some companies avoiding contracts that are longer than 15 years;[12] however, some renewable developers will only accept contracts that are 20 years or longer in order provide them with development cost recovery certainty. States and utilities also vary in the length of direct purchase agreements that customers are allowed to sign, with a number of states limiting the duration of direct access programs to one or several years while others require long-term contracts. Westar Energy of Kansas, for example, requires corporate actors to sign 20-year term renewable energy contracts, while Georgia Power provides corporate customers with the option of ten, 15, 20, 25- or 30-years contracts at a consistent rate no matter the length of time.

Conclusion

Into 2019 and coming years, businesses and other entities are projected to continue procuring renewable energy at strong rates, supported by continuing federal tax incentives. While historically tech companies have been the largest procurers (and are likely to continue strong renewable procurement programs), analysts also expect that the growth and variety of different procurement options, as described above, is likely to open the market to other commercial and industrial players.[13] Many of these entities will be pursuing renewable generation to meet new and growing corporate sustainability goals. Additionally, the rise of financial products described here is likely to increase the participation of other entities who are looking to have more control over their electricity costs.[14] Utilities and states

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10 Customer eligibility refers to which commercial and industrial customers are eligible for direct access renewable energy procurement.

11 Advanced Energy Economy, "Renewable Energy Offerings That Work For Companies," (April 2019). https://info.aee.net/renewable-energy-offerings-that-work.

12 Joel Makower, "How Google and Walmart work with utilities to procure clean power," *Green Biz*, (April 9, 2018) https://www.greenbiz.com/article/how-google-and-walmart-work-utilities-procure-clean-power.

13 Wood Mackenzie, "Technology giants top list in bumper year for corporate procurement," (January 25, 2019) https://www.woodmac.com/news/editorial/us-renewables-technology-giants-top-of-the-list-in-a-bumper-year-for-corporate-procurement/

14 Greentech Media, "Sizing Up the Corporate Renewables Market," (August 21, 2019) https://www.greentechmedia.com/articles/read/sizing-up-the-fluid-corporate-renewables-market#gs.1yj1bp

will play a critical role in the next phase of the corporate renewable procurement market—through program offerings and policies, respectively, each has the potential to create significantly more access to renewables for interested businesses.

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