WORLD RESOURCES INSTITUTE

TECHNICAL NOTE

U.S. RENEWABLE ENERGY MAP: A GUIDE FOR CORPORATE BUYERS

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1. SUMMARY

The "U.S. Renewable Energy Map: A Guide for Corporate Buyers" (hereafter referred to as the Map) is an interactive map that presents the renewable energy purchasing options offered to large-scale buyers by electric utilities in each state across the United States. The Map is designed for commercial and industrial (C&I) energy buyers seeking information on opportunities to purchase large-scale renewable energy from their utility. It also serves as a market indicator for utilities that wish to attract the growing number of customers seeking large-scale renewable energy by providing a platform to communicate which renewable energy products are offered.

The Map provides information on, first, the renewable energy options offered to buyers and, second, which of the six Corporate Renewable Energy Buyers' Principles (WRI and WWF 2016; hereafter referred to as the Principles) each renewable energy product meets.

This technical note outlines the scope of the Map and the methodology behind its presentation of available renewable energy options.

CONTENTS

Technical notes document the research or analytical methodology underpinning a publication, interactive application, or tool.

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2. BACKGROUND

In the past decade, the demand for renewable energy among corporate buyers has grown significantly. In 2013, 60 percent of the largest U.S. businesses had set public climate and clean energy goals (Calvert Investments et al. 2012, 2). As of 2016, 71 Fortune 100 companies and 215 Fortune 500 companies (43 percent) have a stainability or renewable energy target, or both. Of the latter, 22 companies have further committed to meeting 100 percent of their electricity needs from renewable energy (Advanced Energy Economy 2016).

Recognizing that businesses were actively seeking opportunities to procure both the energy from renewable energy projects and the Renewable Energy Certificates (RECs) for their facilities, and that clearer guidelines were needed to help them do so, World Resources Institute (WRI) and World Wildlife Fund (WWF) convened leading companies to develop the Principles. These Principles frame the challenges and common needs faced by large renewable energy buyers and, ultimately, let utilities know what customers are seeking from the market.

Today, 65 companies have signed on to the Principles with the hope of spurring the creation of new opportunities and choices and new collaborations with utilities and energy suppliers, to ultimately increase their ability to buy renewable energy.

Although the Principles provide guidance on what corporate buyers are looking for, these buyers must still navigate a patchwork of state utility regulation in the United States to determine where these renewable energy products are offered. The Map provides a visual solution by marking the renewable energy options offered in the different states.

3. BUYERS' RENEWABLE ENERGY OPTIONS

The Map provides information on, first, the renewable energy options offered to buyers.

Corporate buyers have various means of procuring bundled renewable energy and RECs. They can purchase electricity directly from renewable energy producers over the grid if the market allows, employ onsite renewable energy solutions, or work with their electric utilities to buy energy over the grid.[1]

The Map begins by identifying where customers have the ability to directly purchase renewable energy by designating which states have electric retail choice easily available. In electricity markets where customers do not have the ability to directly purchase their energy from alternate suppliers, they must either supply their own renewable energy or work with their electric utilities.

Some corporate buyers may contract for onsite renewable energy by, for example, leasing or signing a power purchase agreement (PPA) for a solar array on their facility. Since the amount of energy produced under this arrangement is limited by both space constraints and regulation, the buyers must then look to large-scale options offered over the grid through their electric utilities. The Map thus focuses on large-scale utility renewable energy options, as they comprise the bulk of the purchases corporate buyers will make to meet their goals.

The electric utility options identified by the Map include where corporate buyers can utilize green tariffs and/or have the opportunity to enter into one-on-one renewable energy deals (see below). The Map spotlights these options because they offer customers bundled renewable energy products, including both the energy from the renewable energy project and the associated RECs. Corporate buyers seek RECs to match their electricity usage and meet their sustainability goals (Tawney and Ryor 2014). Traditionally, RECs have been acquired at an additional cost and separately from the energy being sold by the renewable facility. Corporate buyers are now seeking a single utility product that offers both the energy and the associated RECs. They prefer products that also provide the economic benefits of utility-scale renewable energy projects, such as controlled costs and potential cost savings with long-term contracts (Barua 2016). Green tariffs and one-on-one renewable energy deals can offer this.

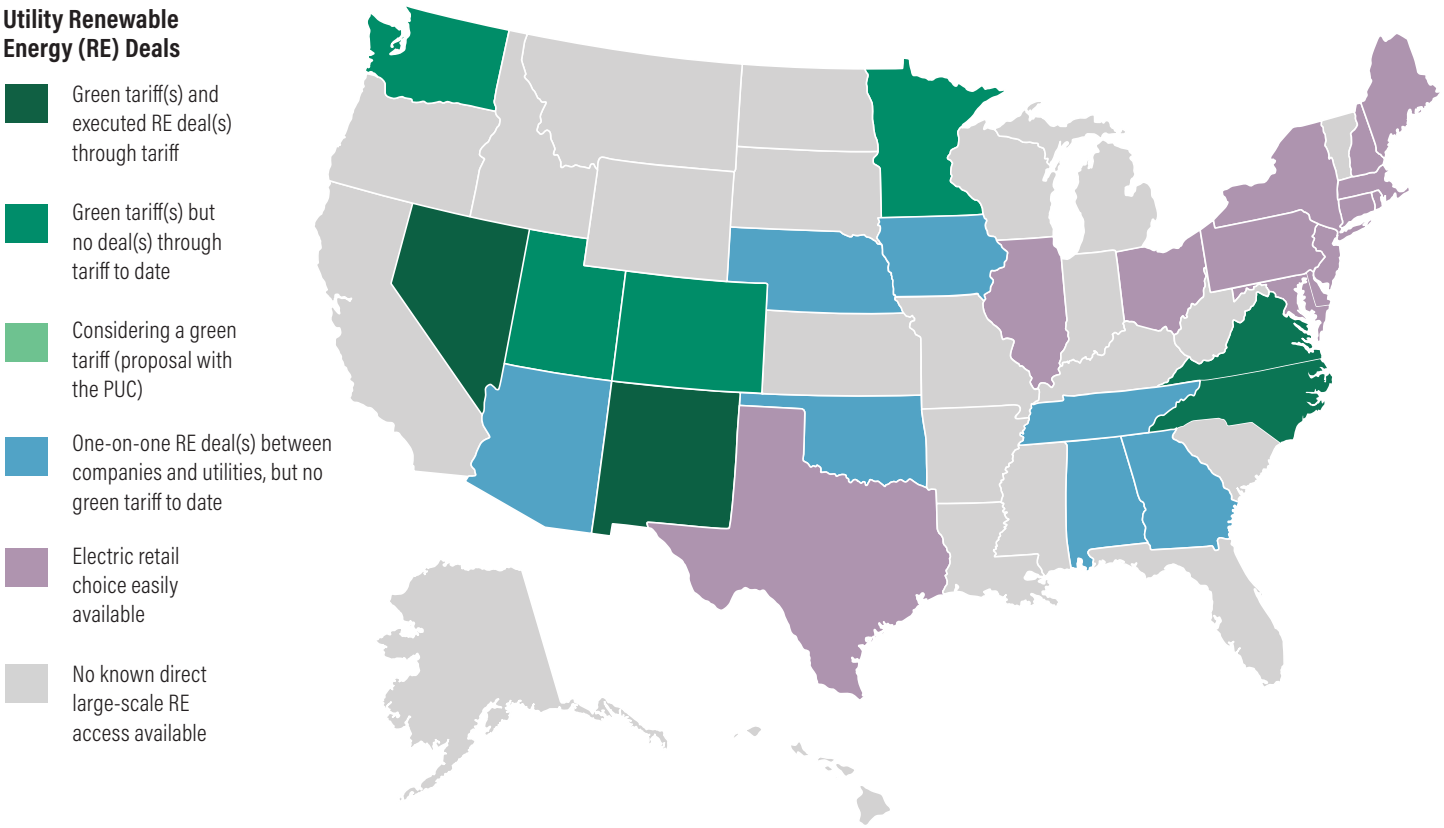
Accordingly, the Map indicates the presence of the following renewable energy options in the different states:

- Utilities with a green tariff(s) and executed renewable energy deal(s) through tariff
- Utilities with a green tariff(s) but no deal(s) through tariff to date
- Utilities considering a green tariff, which means they have a proposal with the public utility commission (PUC)
- One-on-one renewable energy deal(s) between companies and utilities, but no green tariff to date
- Electric retail choice easily available
- No known direct large-scale renewable energy access available

As of April 2017, the renewable energy options are designated by the color scheme shown in Figure 1.

The scope of each of these renewable energy options is expanded upon below.

Figure 1 | **U.S. Renewable Energy Map: A Guide for Corporate Buyers**



3.1 Green Tariffs

3.1.1 Defining a Green Tariff

The green tariffs included in the Map are identified by WRI's publication *Emerging Green Tariffs in U.S. Regulated Electricity Markets* (Tawney et. al 2016).[2]

According to *Emerging Green Tariffs*, a green tariff is a price structure, or an electricity rate, offered by a local utility and approved by the state's PUC that allows eligible customers to source up to 100 percent of their electricity from renewable resources. Through a green tariff, customers are able to purchase both the energy from a renewable energy project, at a large-scale,[3] and the associated RECs.

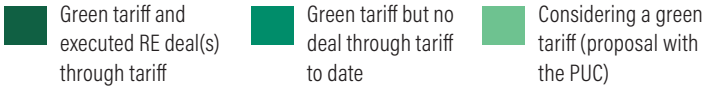
Because the Principles outline what large buyers are looking for from the market, we track which green tariffs meet certain Principles. A green tariff by definition does not, however, need to meet all of the Principles.

Green tariffs vary across the country and are relatively complex. As utilities work toward meeting customer demand for renewable energy, several models have emerged. *Emerging Green Tariffs* identifies over sixteen characteristics that vary among the green tariffs available today.

Nonetheless, green tariffs can be broken down into the following models: tariffs and riders and subscriber programs (Tawney et al. 2016).

- Tariffs and riders: A tariff replaces the standard electricity rate customers are charged on their bills with the cost of the renewable energy. A rider, in contrast, is added on top of the standard rate. Riders usually include both the total cost of the renewable energy and a credit for other services not utilized under the rider—for example, the fossil-fueled power the customer replaced. Generally speaking, both tariffs and riders serve a larger electricity load by utilizing a PPA, which facilitates the making of a direct contract with a renewable energy project through the utility to provide the energy to the customer.
- Subscriber programs: These programs allow customers to subscribe to a portion of a large renewable energy project(s). The utility usually replaces or credits back the standard charge for fossil-fueled power on their bill. The utility aggregates these smaller customers to make a single, larger project more cost effective.

Figure 2 | **Green Tariff Categories**



3.1.2 Green Tariff Categories

Green tariffs exist in various stages, and the Map identifies these stages on a green gradient, according to the categories shown in Figure 2.

The lightest shade of green indicates green tariffs in the initial stages—that is, where the utility has drafted a plan or proposed a tariff with the PUC. The two darker shades indicate the PUC has approved the tariff, with the darkest indicating that a renewable energy deal has been executed through the tariff.

A state that has a deal or deals executed under a green tariff is identified by "GT Deals," which appears in a hover-box, or pop-up window, when the mouse is placed over the state. Deals are added to the Map when they are signed. WRI also tracks new renewable energy capacity related to these deals. In Virginia, for example, Amazon has utilized a green tariff to enter into two deals, as shown in Figure 3.

3.1.3 Additional Utility Renewable Energy Products Not Considered Green Tariffs

On the Map, green tariffs do not include green pricing programs that rely exclusively on RECs and have no energy-pricing component. An example of this would be a utility program in which RECs constitute a premium charge on top of the standard retail electricity rate, often called green power programs.

Furthermore, green tariffs do not include utility programs that can be classified as community choice aggregation or community solar programs. Community solar is loosely defined as a tariff whereby multiple customers are virtually net-metered against a limited share of a local renewable energy project.[4] A green tariff modeled as a subscriber program may appear very similar to community solar; however, key differences distinguish the two, as shown in Table 1.

Figure 3 | **U.S. Renewable Energy Map: A Guide for Corporate Buyers, State Example: Virginia**

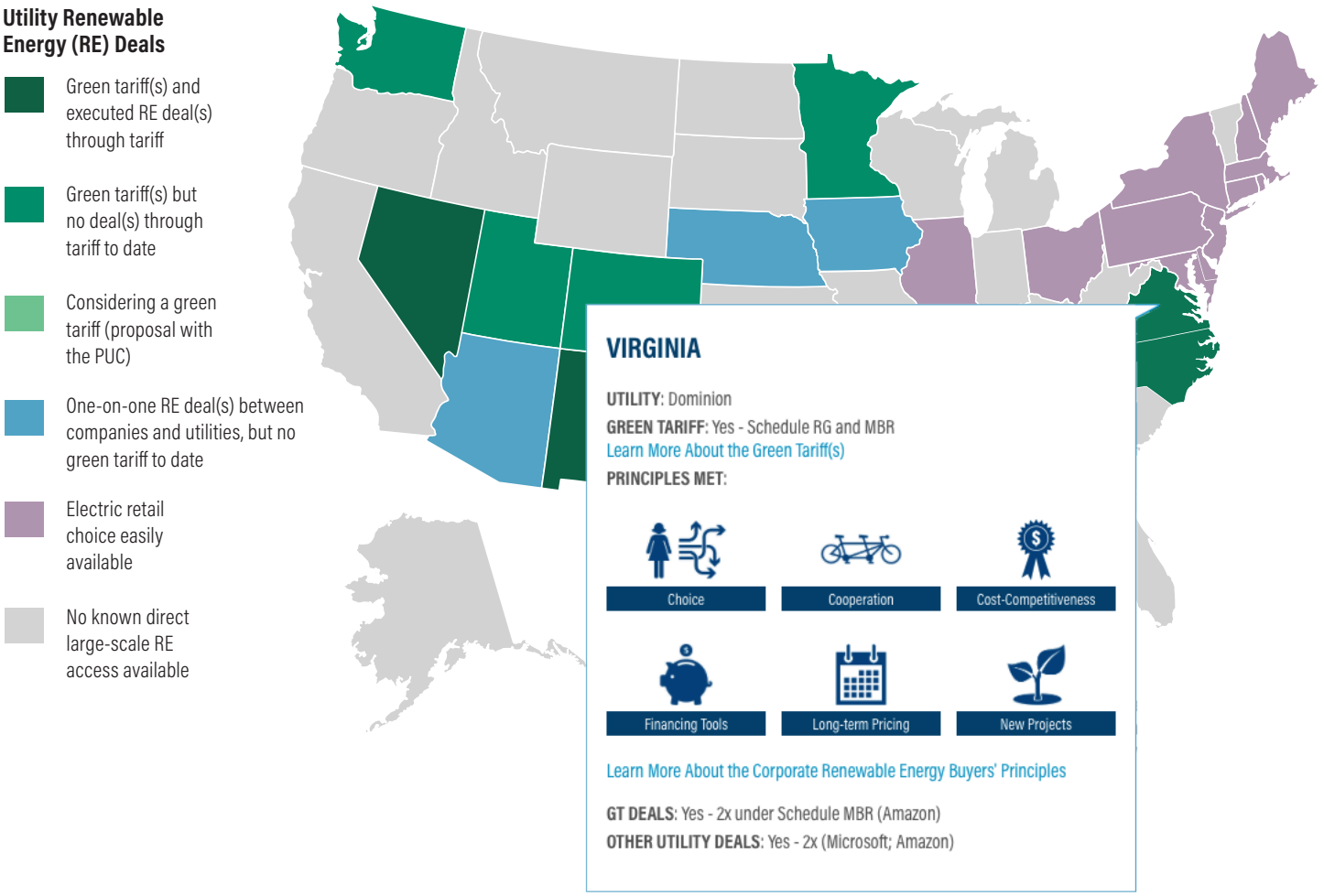


Table 1 | **Comparing Green Tariff Subscriber Programs and Community Solar**

	SUBSCRIBER PROGRAMS	COMMUNITY SOLAR
Program Intent	Designed to enable C&I customers to procure renewable energy	Emerged as a way for residential customers who cannot install solar panels on their roofs to implement residential net metering
Overgeneration	Positive balances not carried over, and customers cannot accrue large positive energy balances	Positive balances from months of excess production carry over and offset winter months with lower solar production—essentially serving as a credit to the customer
Limitations on Available Energy	High limits on the amount of renewable energy to which a customer can subscribe	Customers capped by limited share of renewable energy project

3.2 One-On-One Renewable Energy Deals

The one-on-one deals included in the Map are completed renewable energy deals between C&I customers and electric utilities. These deals are also referred to as "special contracts." Similar to how green tariffs go beyond green pricing programs, one-on-one deals also offer more value to the customer than just a product that offers RECs at a premium charge on top of the full electricity rate.

One-on-one renewable energy deals, however, are negotiated with a single customer. The agreement regarding the elements of the standard rate that are either replaced by the renewable resource or credited back to the customer are set in the context of this deal only and not generally available to other customers. In contrast, green tariffs are a standard offer available to a class of customers and allow a group of customers to procure renewable energy in the same manner. That standard offer may include the ability for customers to procure a PPA that slots into the offer and thus sets the final price, but the essential structure of how the renewable energy will be integrated into the customer's bill has been defined by the tariff.

One-on-one deals are identified in the Map both in states where no green tariffs are available, indicated by the blue shading, and in states where they are available, indicated by the "Other Utility Deals" information provided in the hoverbox (see Figure 3).

Although the Map identifies one-on-one deals, the information it gives on them is not extensive. The public documentation providing details on such deals is often incomplete and the available public information is neither as transparent nor readily available as that on green tariffs. One-on-one deals tend to be privately negotiated and therefore contain confidential terms, even when regulatory approval has been sought. The lack of transparent information can also make it difficult to determine whether these deals meet the Principles (see "Meeting the Corporate Renewable Energy Buyers' Principles," below).

One-on-one deals represent a willingness between an electric utility and a PUC to innovate and try new options in providing renewable energy to customers. In this capacity, one-on-one deals indicate states where customers or developers have an opportunity to start a new conversation. Because one-on-one deals are confidential and not automatically available to other customers, however, they are not as valuable to larger numbers of customers.

Customers lacking the specific knowledge or negotiating leverage necessary to enter into these types of special contracts face constraints in gaining access to or creating the renewable energy products desired. Nevertheless, the Map includes these deals as interesting cases to learn from and to spur conversation.

3.3 Electric Retail Choice

Electric retail choice is defined as "the right of customers to purchase energy from a supplier other than their traditional supplier or from more than one seller in the retail market (EIA 2017)." Designating a state as either having "electric retail choice easily available" or "no known direct large-scale renewable energy access available" involves a complex analysis whose scope is open to debate.

In defining our scope, we started with the U.S. Energy Information Administration (EIA) article, "State Electric Retail Choice Programs Are Popular with Commercial and Industrial Customers" (EIA 2012). According to the EIA, seventeen states and the District of Columbia have adopted electric retail choice programs that allow end-use customers to buy electricity from competitive retail suppliers.[5] Many of these states, however, offer limited retail choice.

Even though some states have enabled retail choice, due to the program design there are inherent constraints that prevent customers from exercising their right to purchase energy from alternative suppliers. Participation in the retail choice program may be capped, and, as the caps are met, retail choice essentially becomes nonfunctional. States that cap participation and, in effect, limit access to retail choice for new customers, include the following:

- California: Retail choice is limited to nonresidential customers and tightly capped. Despite recent efforts to raise the cap,[6] new customers are limited in their ability to use direct access, the program that allows for retail choice in the state.
- Michigan: Sales by nonutility suppliers are capped at 10 percent of each utility's previous year's sales (More and Kirsch 2016, 4). This cap has been reached and retail choice is therefore no longer functionally available.

In both of these states, we will continue to monitor any changes to participation caps, such as efforts to raise them, and will update the Map accordingly.

Furthermore, there are some states that may not have a formal cap, but have other limitations, such as limited participation class and high exit fees, that make the program difficult to use and ultimately prevent full participation. States with participation rates below 25 percent include Montana and Oregon. Montana, for example, limits retail choice by only offering it to large customers with more than 5 kilowatts of load and customers who have been on retail choice plans as of October 2007.[7]

In recognition of these constraints, we have clarified retail choice with the qualifier "easily available." States whose electric retail choice we have deemed "easily available" are those without participation caps or other limitations that hold participation rates below 25 percent. Only those states where retail choice is easily accessible are designated on the Map; we have identified 13 states and the District of Columbia as falling within this definition, as indicated by the purple shading.

4. MEETING THE CORPORATE RENEWABLE ENERGY BUYERS' PRINCIPLES

In addition to highlighting the renewable energy options available to corporate buyers, the Map compares each utility product against the Principles. The Principles met by each utility product are identified in the same hoverbox used to indicate the execution of renewable energy deals.

As previously mentioned, the Principles establish the framework for what customers are seeking from the market. In order to meet customer needs and drive impact, the Principles seek the following:

1. Greater choice in options to procure renewable energy
2. Cost competitiveness between traditional and renewable energy rates
3. Access to longer-term, fixed-price renewable energy
4. Access to projects that are new or help drive new projects in order to reduce energy emissions beyond business as usual
5. Increased access to third-party financing vehicles, as well as standardized and simplified processes, contracts, and financing for renewable energy projects
6. Opportunities to work with utilities and regulators to expand the choices for buying renewable energy

Intended to serve as an indicator of how attractive a product may be for customers, the Principles do not define what constitutes a renewable energy product, and not every renewable energy product offered by a utility will necessarily meet all of them.

Weighing each utility renewable energy product against the Principles helps customers consider how the product aligns with their renewable energy goals and their goals for procuring renewable energy (that is, whether the product facilitates pursuit of their interest in driving new projects). Ultimately, this comparison allows corporate buyers to determine how each option best suits their overall needs.

The more Principles met in a renewable energy product, the more likely the product will be attractive to customers; but, again, meeting all six Principles is not an indication of whether the product can be classified as a green tariff or a one-on-one deal.

Additional information on how utilities can produce green tariffs that are best aligned with customers' needs will be presented in the working paper "Recipe Book for Green Tariffs: An Analysis of Executed Deals" (Barua forthcoming).

5. METHODOLOGY

Green Tariffs, Green Tariff Deals, and One-On-One Deals

As previously mentioned, the green tariffs and green tariff deals included in the Map are identified by WRI's publication *Emerging Green Tariffs*, for which PUC dockets are the primary resource. Information from the PUC dockets regarding green tariff products is then verified with utilities and customers where applicable.

For information on one-on-one renewable energy deals, we use the PUC dockets and verification with utilities and customers, as well as press releases.

Electric Retail Choice

The primary resource used to determine retail choice is the U.S. Energy Information Administration (EIA) article already mentioned, "State Electric Retail Choice Programs Are Popular with Commercial and Industrial Customers."

The EIA is the statistical and analytical agency within the U.S. Department of Energy and the nation's premier source of energy information. By law, the EIA's data, analyses, and forecasts are independent of approval by any other officer or employee of the U.S. government (EIA 2017).

The information presented in EIA 2012 was interpreted from the EIA-861 database. This includes annual data on peak load, generation, electric purchases, sales, revenues, customer counts and demand-side management programs, green pricing, and net metering programs, as well as distributed generation capacity (EIA 2016).

Corporate Renewable Energy Buyers' Principles

The Principles, as established by WRI and WWF, are the main framework used to analyze each of the renewable energy products offered by an electric utility. When determining whether a utility product meets each Principle, the elements in Table 2 are considered.

Table 2 | **Corporate Renewable Energy Buyers' Principles: Elements**

PRINCIPLE	ELEMENTS THAT HELP ADDRESS THE PRINCIPLE
1 Greater choice in our options to procure renewable energy	■ Ability to go beyond the basic portfolio of utility resources in rate base and procure up to 100% of energy from a renewable energy resource of the customer's choice
2 Cost competitiveness between traditional and renewable energy rates	■ Cost reflects fair cost of service for the renewable energy resource ■ Ability to retain the economic benefits if that resource costs less than the utility's standard offer, particularly if the customer has paid the full cost of that resource
3 Access to longer-term, fixed-price renewable energy	■ Option to enter into a contract over various time periods—for example, 5 years, 10 years, 15 years ■ Certainty of energy cost over that period
4 Access to projects that are new or help drive new projects to reduce energy emissions beyond business as usual	■ New renewable power generation that directly adds new capacity to the system ■ Access to bundled renewable energy products—that is, energy and RECs ■ Ability to claim the consumption of renewable energy through retired RECs ■ Renewable energy delivered from sources that are within reasonable proximity to customer facilities, benefiting local economies and communities and enhancing the resilience and security of the local grid
5 Increased access to third-party financing vehicles, as well as standardized and simplified processes, contracts, and financing for renewable energy projects	■ Financing vehicles that include financing and/or procurement of renewable energy through PPAs and/or lease arrangements ■ Ability to preserve the company's capital for core businesses
6 Opportunities to work with utilities and regulators to expand choices for buying renewable energy	■ Continuing relationships between customers and their electric utilities while increasing options for renewable energy procurement ■ Creation of products that reflect the net costs, taking into consideration the actual cost of procurement, and the benefits to the system, while avoiding shifting any cost to other ratepayers

6. DATA AVAILABILITY

The market for access to renewable energy by electric utilities is rapidly evolving. Utilities are growing increasingly aware of customers' desire for renewable energy products and the types of products they are seeking, as outlined by the Principles, and they are creating more renewable energy offerings accordingly. Given the nature of the market, which is expanding quickly but varies from state to state, the Map will be updated as new data become available.

Generally speaking, green tariff data will be updated congruent to updates to WRI's *Emerging Green Tariffs*. The status of green tariffs on the online Map, however, may be more current. It may shift, for example, from "considering a green tariff" to "green tariff(s) but no deal(s) through tariff to date" before the updated release of *Emerging Green Tariffs*.

Beyond green tariff data, we monitor several states' public utility dockets and are in constant communication with both utilities and customers. WRI often learns of new green tariffs, new deals under these tariffs, and new one-on-one deals through this network of resources. The peer-to-peer competition encourages utilities to contact WRI regularly with new renewable energy products. The Map will be updated continuously to reflect any information gained from these ongoing conversations and this monitoring.

As the Map is designed to be updated as new utility products emerge, it allows companies to compare utility offerings when considering where to site new facilities, to prioritize their renewable energy purchasing strategies, and more.

7. LIMITATIONS

Several limitations are inherent to the nature of the Map:

- The green tariff market is rapidly evolving. The various stages of green tariff offerings and completed one-on-one renewable energy deals with utilities may not all be known and/or displayed.
- The Map is not a comprehensive list of one-on-one corporate deals. The rationale behind this is explored above.
- Debate is ongoing regarding which states truly offer retail choice. As previously noted, although some states may technically offer retail choice, the reality is that due to politics and/or the program structure, customers may not be able to gain full access to it. Consequently, the question of which states offer retail choice and whether customers are able to gain access easily to that choice remains undecided.
- The Map provides a state-level view, while green tariffs are implemented at the service utility level. Consequently, if a state is marked, that does not mean every C&I customer has access there.

Since the renewable energy options covered by the Map are constantly evolving, users are encouraged to contact the offering utility for full detail. For information on green tariffs in particular, users may also view the appropriate dockets or filing numbers, as listed in *Emerging Green Tariffs*.

ENDNOTES

1. The Public Utility Regulatory Policies Act of 1978 (PURPA)(Pub.L. 95–617, 92 Stat. 3117, enacted November 9, 1978) is another tool used to bring renewable energy onto the grid. PURPA requires utilities to purchase power from independent companies, under certain circumstances. The design of PURPA does not, however, easily accommodate corporate buyers. Under the act, the utility, not the corporate buyer, is the ultimate buyer of the renewable energy. Corporate buyers may be able to purchase the RECs from a PURPA project, but they cannot easily obtain access to the fixed-price energy from the project, as that is sold to the utility for use by all ratepayers. For this reason, we have not identified PURPA as a central tool for corporate buyers to obtain access to renewable energy.
2. This publication is updated at various points in each calendar year.
3. Typically, green tariff project sizes are 20 MW or more.
4. For additional information on community solar programs, see the U.S. Department of Energy's "Guide to Community Solar: Utility, Private, and Non-profit Project Development." http://www.nrel.gov/docs/fy11osti/49930.pdf.
5. Although this article was produced in 2012, it remains current and reliable. Retail choice is a result of deregulation efforts and accompanying state legislation. Many states began the deregulation process, and other efforts to restructure the electric power industry, in the 1990s. Since this initial deregulation boom, retail choice has not significantly expanded in the United States. The data used to compile "State Electric Retail Choice Programs Are Popular with Commercial and Industrial Customers" have therefore remained static.
6. Senate Bill No. 286, 2015–2016 Reg Sess. (Cal. 2015), http://www.leginfo.ca.gov/pub/15-16/bill/sen/sb_0251-0300/sb_286_bill_20160301_amended_asm_v93.pdf.
7. In 2007, the Montana legislature amended the Electric Utility Industry Restructuring and Customer Choice Act granting retail choice to small residential and commercial customers in the state. This was done through House Bill No. 25, titled "Generally Revise Electric Industry Restructuring Law" (American Public Power Association 2012, 8). The House bill is at http://leg.mt.gov/bills/2007/billpdf/HB0025.pdf.

GLOSSARY

PPA — Power purchase agreement.

PUC — State public utility commission, which regulates the electric utilities in a given state.

REC — Renewable energy certificate attributed to renewable generation under state RPS requirements.

Rider — Additional rate applied to an electricity tariff.

Tariff — Electricity pricing, and price structure, charged to consumers.

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ABOUT WRI

World Resources Institute is a global research organization that turns big ideas into action at the nexus of environment, economic opportunity, and human well-being.

Our Challenge
Natural resources are at the foundation of economic opportunity and human well-being. But today, we are depleting Earth's resources at rates that are not sustainable, endangering economies and people's lives. People depend on clean water, fertile land, healthy forests, and a stable climate. Livable cities and clean energy are essential for a sustainable planet. We must address these urgent, global challenges this decade.

Our Vision
We envision an equitable and prosperous planet driven by the wise management of natural resources. We aspire to create a world where the actions of government, business, and communities combine to eliminate poverty and sustain the natural environment for all people.

Our Approach
COUNT IT
We start with data. We conduct independent research and draw on the latest technology to develop new insights and recommendations. Our rigorous analysis identifies risks, unveils opportunities, and informs smart strategies. We focus our efforts on influential and emerging economies where the future of sustainability will be determined.

CHANGE IT
We use our research to influence government policies, business strategies, and civil society action. We test projects with communities, companies, and government agencies to build a strong evidence base. Then, we work with partners to deliver change on the ground that alleviates poverty and strengthens society. We hold ourselves accountable to ensure our outcomes will be bold and enduring.

SCALE IT
We don't think small. Once tested, we work with partners to adopt and expand our efforts regionally and globally. We engage with decision-makers to carry out our ideas and elevate our impact. We measure success through government and business actions that improve people's lives and sustain a healthy environment.

Maps are for illustrative purposes and do not imply the expression of any opinion on the part of WRI, concerning the legal status of any country or territory or concerning the delimitation of frontiers or boundaries.

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