

What Does “100% Renewable” Really Mean?

There is reason for optimism in changes made by businesses in how they use energy and how they purchase that power. But as firms commit to using greener electricity, the public should examine corporate progress reports and what such voluntary goals actually mean



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There is a movement among business to use less power obtained from fossil fuels, which in many cases means more renewable energy. Some companies are even pledging to go “100 percent renewable,” with firms joining such groups as RE100 and the Renewable Energy Buyers' Alliance, signing on to the Corporate Renewable Energy Buyers' Principles, and undertaking other initiatives. At least 150 large companies, including the tech Big Three, Apple, Facebook, and Google, have set goals to rely exclusively on renewable energy by a certain date. Many others have targets of relying on substantial percentages, in portions of their operations, or in certain locations. There are many strategies that can be used in setting and fulfilling such goals, with differing effects on the energy environment and resulting emissions of greenhouse gases and other pollutants.

In this ELI Policy Brief, we will refrain from using the term *carbon free* in referring to renewable energy. Greenhouse gas goals are often linked to use of renewables, but accounting systems differ. Wind, solar, hydropower, geothermal, and in some instances biomass typify renewable claims recognized by RE100.

Despite the lack of a federal mandate, many companies already tell how much renewable energy they use. This information is conveyed in annually published sustainability reports or in public statements and news releases. Given that there is also no federal requirement for businesses to use renewables, let alone standards for reporting on them, and that firms set their own goals, how should the public understand such statements of progress? Intriguingly, can differences in companies' renewable strategies make a difference in the development of new energy facilities? How can we tease out the role of investments by utilities to comply with state mandates or customer demand? Finally, what are the market effects of price and availability of renewables?

There may be no requirements at the national level, but states are imposing their own mandates, while many utilities are helping them lead the charge. Currently, according to the National Conference of State Legislatures, 29 states plus Washington, D.C., and three territories have adopted renewable portfolio standards, which require power companies to produce a certain percentage or amount of electricity from renewable sources by

a certain year. In addition, eight other states and one territory have set substantive renewable energy targets.

Utilities can reach their goals by generating or purchasing *renewable energy certificates*. EPA notes that states define “the project types and geographic locations from which utilities must source RECs to

or have a clear strategy with a timetable for doing so, or at the least within 12 months of joining develop “a clear road map for going 100 percent renewable.” Member companies must credibly plan to reach 100 percent no later than 2050, with specific minimum interim milestones.

Currently, there are 155 members in the RE100.

These companies come from a variety of sectors and in addition to the Big Three tech firms mentioned earlier include Adobe, BMW Group, GM, HP, Johnson & Johnson, Microsoft, and Walmart. Other businesses that are not members of the RE100 have similarly committed to relying solely on renewable electricity in certain circumstances, often in their operations in certain countries. These include Intel, Samsung, and Amazon Web Services.

Some companies have not committed to rely exclusively on renewable sources, but have nonetheless set numeric goals for themselves, including CISCO (85 percent of global electricity by 2022), Dell (50 percent by 2020), and IBM (55 percent by 2025). Not all companies state renewable energy goals in percentages. Lenovo, for example, has a “renewable energy goal of



use toward compliance.” The NCSL notes that approximately “half of the growth in U.S. renewable energy generation since 2000 can be attributed to state renewable energy requirements.”

As the price decreases, utilities have begun to offer more renewable electricity to large clients, the focus of our inquiry. Utilities in 15 states can supply power through green tariffs. Several additional states offer one-on-one renewable energy arrangements between companies and utilities, but no formal green tariff programs.

Many companies have now joined the group RE100, which requires them to commit to sourcing all of their electricity from renewable sources throughout their entire operations globally. All companies joining RE100 must already obtain 100 percent of their electricity from renewable sources,

achieving 30 MW of Lenovo owned or leased renewable generation capacity globally by FY 2019/20.”

Many companies report on geographic goals. For example, Apple, Google, HP, Intel, and Microsoft state that within the United States they are already using 100 percent renewable electricity or are matching their consumption with RECs. CISCO reports that 80 percent of its global power consumption in 2017 came from renewable sources. Microsoft says that in 2017 it relied on 96 percent renewable electricity globally.

Some companies explain why they set goals other than 100 percent. For example, IBM noted in its 2017 environmental report that differences in the size and location of its data centers and their relatively low demand “make it economically difficult to match renewable generation sources to consumption.” IBM also notes that many of its facilities are leased. Some companies also have difficulties obtaining attributes of renewable energy in certain geographic areas where

they have their operations. For example, Samsung states that in South Korea, “where 65 percent of our electricity consumption happens, there are currently no available RECs trading systems or PPAs,” which are power purchase agreements, and adds that the physical environment “does not lend itself to the development of large scale wind or solar facilities.”

A company can obtain renewable energy by producing it or by purchasing it, but in either case the firm would need to keep the RECs associated with that energy to claim credit. According to EPA, a REC is issued when “one megawatt-hour (MWh) of electricity is generated and delivered to the electricity grid from a renewable energy resource.” An entity owning the REC “has exclusive rights to make claims about ‘using’ or ‘being powered with’ the renewable electricity associated with that REC.” A REC can be “bundled” — acquired together with the associated electricity — or “unbundled” and acquired separately.

Where a company generates the power it uses, it can claim the RECs, or it can sell the energy and keep the associated RECs. A company can also purchase renewable power from utilities, from generators, and from third parties (sometimes called energy retailers). Green tariffs — optional programs approved by some state public utility commissions — allow customers to buy bundled renewable electricity from a specific project through a special fee; these are currently available in 15 states.

A company can also enter into a PPA or a virtual power purchase agreement, or VPPA, with a renewable power generator. Under the former, a consumer contracts to receive the power generated from renewable sources. The power generating facility and the company’s operational facility need to be located in the same grid region. Under VPPAs, the company agrees to purchase the electricity and the RECs at a contract price, but does not receive the electricity. Instead the generating facility sells it into the grid; the electricity may be generated outside of the grid region of the company’s operations. If the sale price received by the generator is below the contract price, the company makes up the difference. Companies who enter PPAs and VPPAs can structure them so that they keep the associated RECs.

Lastly, companies can purchase unbundled RECs from third parties, without entering into agreements to buy electricity. In the United States, there are ways to register RECs. Electronic tracking systems register information about each generated megawatt-hour, issue RECs to the generating entities, and assign a unique serial number. These tracking systems allow RECs to be easily transferred from one entity to another.

When an entity wants to claim RECs it has in its possession, it needs to “retire” them, so that the same RECs cannot be claimed by two different entities. A company cannot claim the use of renewables, even if it actually used renewable energy in its operations, if it does not have the RECs. Given that the voluntary market where companies purchase RECs has little regulatory oversight, EPA recommends that companies “buy green power products that are third-party certified and verified.”

The price of a REC differs in different parts of the country, depending on supply and demand. RECs that meet state RPS compliance requirements are often more expensive than the RECs that do not. EPA notes that state RPS policies often create markets for eligible RECs with “established procurement levels, timetables, [and] geographic boundaries, and [that] penalize non-compliance.” This can result in a scarcity of compliant RECs, driving higher prices in some locations. Meanwhile, RECs used to meet voluntary goals do not have these requirements and tend to be less expensive. The price of voluntary RECs can depend on geographic location, certification, technology, generation date, and competition with compliance-eligible RECs. Unbundled RECs tend to have a low price, are easy to buy, and can be chosen based on particular qualities, such as geography, resource, and time period. Because of price and availability, unbundled RECs dominate the voluntary market, most coming from wind projects, primarily from

Kansas, Oklahoma, and Texas.

While a purchase of RECs that will be generated by future projects helps encourage new generation of renewable energy, purchase of RECs generated a long time ago does little to encourage investments in the renewables market. Thus, in order for a sale to be Green-e Energy Certified, it needs to occur within 21 months of the generation of the REC. Some states

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even require that RECs counted towards RPSs be generated the same year they are claimed.

Given that there are no mandatory standards for renewables use by the private sector, it should not be surprising that different companies utilize different terminology when they describe their progress. For example, when making a claim of 30 percent renewable energy use, one company might mean that it self-generated that much renewable energy or that it helped bring new renewable energy projects to fruition via PPAs, while another company may simply have bought unbundled RECs from long-established wind farms.

Companies also use different terminology to describe their practices. For example, RE100 and member companies use the term *match* to refer to a substitution “of the electricity used across [their] global operations with electricity produced from renewable sources.” For example, Apple states that its Bonnybrooke solar array project produces “over 147 million kilowatt-hours of clean, renewable energy a year, which more than fully matches the energy used by the [near-by] data center” in Mesa, Arizona. GM, another RE100 member, states that “100 percent of the electricity used at Flint Metal Center and Flint Engine operations is matched with wind power, which helps defray the cost of renewable energy for other consumers.” Yet, when IBM talks about matched consumption, it limits this term to renewable energy that is produced in the same grid region as the electricity-using facilities.

Companies provide different types of information with regard to their progress toward their renewable energy goals. We examined corporate reports and other publicly available data for major international companies in the technology and data sectors, as well as some large manufacturers and retailers, in order to understand the variations in approach. Our research revealed great differences in the information companies provide. Many reports do not show percentages of each method used to obtain renewable energy. This can obscure companies’ effect on the development of new energy sources.

While disclosure of an overall percentage of renewables use is helpful, it is not very informative. A

company could state that it used 50 percent renewable energy, but it may have had little impact on investment if it bought old unbundled RECs from existing renewable energy facilities in distant markets at a very low price. Contrast that with investments in renewable energy that displaces fossil fuels in markets where the company operates.

RE100 currently allows member companies to count unbundled RECs toward their 100 percent goal. Meanwhile, the Corporate Renewable Energy Buyers’ Principles, which some of the members of RE100 have signed, proclaim that signatories “are increasingly interested in access to bundled energy and REC products,” stating that “unbundled RECs do not deliver the same value and impact as directly procured renewable energy from a specific project or facility.” The principles are an initiative of REBA, an alliance of clean energy buyers, energy developers, and service providers that helps energy buyers procure more renewable energy.

According to REBA’s Corporate Renewable Deals Tracker, its members entered into 75 renewable energy contracts in 2018 alone, including PPAs, green tariff and other green power purchases, and project ownership. This was an increase from 31 contracts in the previous year.

Companies’ energy reports also show that some are seeking to invest in new renewable projects and/or bundled RECs, instead of purchasing unbundled RECs. Adobe, Google, and IBM, among others, have explicitly announced and explained their decisions not to use unbundled RECs. Others, including Microsoft and HP, and especially companies with operations in China, continue to rely substantially on unbundled RECs. According to RE100’s annual reports for 2016 and 2017, member companies are now acquiring more renewable electricity through PPAs, green tariffs or green products, and self-generation, while unbundled RECs represent less than half of RE100 firms’ renewable energy sourcing. Specifically, while the percentage of unbundled RECs decreased from 59.6 percent in 2015 to 46 percent in 2017, the percentage of PPAs increased from 3.3 percent in 2015 to 16 percent in 2017, and since 2016, the sum of PPAs and green electricity tariffs and products has been over 50 percent.

There are both benefits and drawbacks from counting unbundled RECs toward a company’s voluntary

Green tariffs — optional programs approved by some state public utility commissions — allow customers to buy bundled renewable electricity from a specific project

renewable energy goal. There is benefit in that doing so allows firms that are unable to build new renewable projects or purchase power from them to show support for renewables. Another is that unbundled RECs can be much cheaper. The drawbacks include the fact that purchases of unbundled RECs may not have the same impact on the renewables market as self-generation of renewable electricity or investment in renewable projects that otherwise would not be built.

If all the methods of obtaining renewable energy are treated equally in reporting, this sends an ambiguous message to customers and investors about the extent of the benefits actually achieved. A better approach is to state the amount of renewable energy a company generates; acquires through PPAs, green tariffs, and VPPAs; actually uses during its operations; and claims by applying bundled or unbundled RECs to match its use of non-renewable electricity. Percentage goals alone are not sufficient as a marker of progress and transformation of the global energy mix.

Unfortunately, even if a company wants to create more renewable energy projects in grids where it operates, it is not always possible to do so. A firm can face a number of challenges, including limited ability to generate substantial amounts of renewable energy in a geographic area, high prices of RECs in certain markets, and difficulties integrating new renewable energy projects into the grid.

Given that prices of renewables can be high in certain areas, and that not every company is planning to open new locations where renewable energy is cheaper, some businesses are at a disadvantage in progressing toward high renewable goals. For example, if a company is located in an RPS state, surrounded by other big companies with high demand for renewable electricity, and there is limited capacity to develop new energy projects, there is not much flexibility.

This situation is exacerbated by the fact that REC prices in RPS states are higher because there is demand from utilities. Right now, utilities need the RECs to prove that they produced a certain amount or percentage of renewable energy, and companies need the RECs to prove that they used the renewable energy. Purposes are different in production versus

use, but both need the RECs. If there were different types of instruments to prove generation and use of renewable power, such as if there were a production REC and a use REC for each megawatt-hour of generated electricity, the problem of high prices of RECs might be helped.

This problem of high REC prices is also connected to the fact that renewable energy is more easily generated in some regions than others, and it is not currently possible to physically transmit the electricity from some areas — some grids are too far away, and some are simply not connected to each other. Better grid interconnections are clearly needed. For companies that are unable to purchase expensive local RECs, cheaper unbundled RECs from far away might be the only way to show progress in meeting voluntary goals or standards such as RE100.

Given the current state of our electricity infrastructure, grid managers may be constrained in their ability to quickly accommodate some renewable energy goals companies are creating for themselves. Corporate demands have risen significantly, and the infrastructure has had little time to adjust.

According to the Wind Energy Foundation's report "Transmission Upgrades & Expansion: Keys to Meeting Large Customer Demand for Renewable Energy," businesses are buying so much wind and solar power that the increased demand may exceed the capacity of existing and planned transmission lines. Companies are "acting on their publicly announced renewable energy goals as new utility-scale wind and solar energy projects are now often the lowest cost power available." According to the report, "Existing and planned transmission facilities may not be sufficient to deliver the amount of renewable energy companies have already committed to buying."

WEF estimates that "planned transmission build-outs would meet only 42 percent of corporate renewable energy demand in a high-procurement scenario, or 78 percent of the demand in a low-procurement scenario." WEF recommends that corporate buyers "participate in regional and inter-regional transmission planning conversations to ensure future transmission infrastructure meets customer demand for renewable energy." It goes on to "encourage transmission planners and state Public Service Commissions to increase access to affordable,

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renewable energy by approving upgrades and expansion to transmission lines.” Finally, it seeks to “urge the Federal Energy Regulatory Commission to continue to work to improve the interregional planning process.”

Wind and solar generating assets deliver energy when the wind is blowing or the sun is shining, with existing wind facilities having an average annual capacity factor of 35 percent and solar an average of 25 percent. The capacity factors are rising with newer technology, and improving storage technologies will likely increase these numbers further. In order to ensure availability of reliable power on the grid, however, sufficient generation capacity must be available to fill in any remaining gaps. This necessitates the maintenance and financing of sufficient generation capacity and grid interconnections, as well as appropriate capacity planning and dispatching to support the reliability of the system across the full range of operating scenarios.

Grid storage technologies could be particularly useful to capture generated renewable energy during times of low demand and to disperse it during times of high demand, so as to even out variability in supply. Best results from utilization of such techniques, however, would require proper planning and reliance on rules that address grid storage issues. This is likely to involve both the federal government (FERC is already involved) and states.

Although corporate reports vary with regard to the types of information they convey about strategies to reach their renewable energy goals, several voluntary guides offer advice on how to make claims about renewable use.

RE100’s “Guide on Making Credible Renewable Electricity Usage Claims” states that assertions about renewable electricity “should be specific enough to ensure reasonable understanding of the materiality of the [renewable energy] purchase.” It emphasizes that “lack of specificity can lead to confusion” and that when a company makes a public claim, it should take into account, among other aspects, the purchasing option it employed, the geographic boundary of the consumption, the amount or percentage of renewable energy purchased, the length of the company’s

commitment, and any certifications used. If all the RE100 members conveyed information about their renewable energy purchases using these categories, with the addition of a clear delineation of the number of unbundled and bundled RECs, such conformity could substantially improve public understanding of renewable energy claims.

Last year, the World Resources Institute produced a helpful guide called “Describing Purchaser Impact in U.S. Voluntary Renewable Energy Markets.” This report identifies two key elements of clear communications about renewable energy claims: “what you did” and “how you did it.” These elements address the scale, scope, term, and impact of the purchase and the role of the procurement in the energy outcome, meaning financial and risk positions, policy changes, or other aspects of the market transformation. The guide explains that the “multitude of ways that consumers buy and use [renewable energy] have very different impacts on transforming the electricity grid.” The report then provides a number of examples about ways a company can describe how it obtained renewable energy and what impact it had on the green power market.

As many companies commit to relying exclusively or substantially on renewables, the public should examine what a company means by its goal as well as by its stated progress. The current record of claims and reports reflects differences among companies, the voluntary nature of the drivers of demand, and the fact that firms are learning as they go. The changes made by businesses in their energy use and renewable energy purchase methods present a profound reason for optimism, but also an equally important need for clarity.

Bold numbers play an important role — and they are easy for the public, policymakers, and employees to remember. But attention to the specifics is also important. An achievable goal that stimulates real investment in renewable energy and displaces fossil fuel demand may be far more important than a high goal that reflects only a company’s available cash and the ready availability of unbundled RECs. As businesses move forward, competing for who sets higher standards when it comes to renewable energy, perhaps, the real competition should be for the level of green impact they create in the grid. **TEF**

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ELI traces its origins to a national conference on the emerging field of environmental law held at the Airlie House in Virginia in September 1969. Attended by 50 lawyers, practitioners, and academics from across the country who were breaking new ground in this fertile area of law, the gathering endorsed the creation of the Environmental Law Institute and the *Environmental Law Reporter*. On December 22, 1969, the very same day that NEPA was passed, ELI was officially incorporated. ELI has since grown to become a major research, education, and publication center for the full range of environmental professionals.

Throughout the year, in celebration of our 50th, ELI is reflecting back on our important work in shaping environmental law and governance and imagining an even more impactful future.

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