Clean Energy Pathways for Texas

Renewable Energy Credits and other tools for local governments

ENVIRONMENT TEXAS RESEARCH & POLICY CENTER

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Cover photo: Wind turbines in West Texas, spring 2019. Photo credit: Sam LaRussa via Unsplash.

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Executive summary

Many local governments in Texas are working hard to protect the environment and fight climate change. For cities and counties, a big piece of that effort is using renewable energy, which brings reductions in carbon emissions and air pollution.

Renewable energy certificates (also called renewable energy credits, or RECs) are a key tool that cities, counties, businesses and institutions have used to meet their commitments to adopt renewable energy. Renewable energy credits are uniquely identified financial instruments associated with the generation of renewable energy, which can be bought and sold separately from that energy itself and are used to prove the purchase of renewable energy.[1]

Using RECs to subsidize and drive renewable energy development has helped make renewable energy more affordable and economical – helping to accelerate the rapid adoption of clean energy technologies. Texas, for example, increased its wind and solar generation more than any other state between 2001 and 2020 and, in 2020, was the nation's top producer of electricity from the wind and the sun.[2]

But making wind and solar power cheaper, while important, is no longer the primary hurdle facing Texas' transition to renewable energy. Overcoming transmission limits, interconnection delays and regulatory hurdles, and ensuring that clean energy can power Texas cities and counties at every hour of every day are among the key challenges standing in the way of the transition to 100% renewable energy.

Purchasing RECs is helpful, but cities and counties committed to achieving 100% renewable energy need to take additional action. Texas cities and counties seeking to meet their renewable energy commitments should explore tools like bulk power purchasing to bring that energy to their residents. And they should pursue a range of strategies – including investments in local sources of renewable energy and energy storage, in addition to buying RECs – to help lead Texas' transition to renewable energy.

RECs have been a useful tool to promote the transition to renewable energy.

RECs arose in the late 1990s and early 2000s as a way for states to track compliance with renewable energy standards and to provide a mechanism the growing market for renewable energy could use.[3] RECs have served as a useful tool for governments, utilities, companies and individuals to invest in renewable energy, as a signal of demand for renewable energy, and as a revenue source for renewable energy developers.[4] In Texas, RECs are the tool used most often by retail electricity providers – and some municipal utilities – to deliver "100% renewable energy" electric plans.[5]

From 2015 to 2020, national unbundled (i.e., sold separately from the electricity) REC prices were about $1 per megawatt-hour (MWh), rising to $6.60 per MWh in August 2021.[6] In Texas, wind REC prices on the spot market were less than $1.00 per MWh from 2014-2020, and were around $3.50 per MWh in early March 2022.[7] The revenue from selling those RECs goes back to the owner of the renewable energy facility, along with the revenue from sale of the power itself and any tax credits or other incentives.

RECs have important limitations.

"100% renewable energy" plans sold to Texas electricity consumers often rely on the purchase of RECs on the open market. In this context, RECs have important limitations.

- RECs often support projects far from centers of energy demand, putting pressure on the transmission system and reducing the potential of renewable energy purchases to clean up local grids.
- Revenue from REC sales can be a small and uncertain piece of the total revenue for a project, limiting the ability of RECs to drive new renewable energy development (especially when compared to direct purchases of renewable energy).[8]
- RECs are not currently designed to support other key technologies needed for the transition to 100% renewable energy, including energy efficiency and energy storage technologies or programs.

Texas cities and counties with renewable energy goals should adopt plans that support the broad range of technologies and actions needed to move Texas and the nation toward a 100% renewable energy system. REC purchases on open markets can be an important piece of local governments' efforts to reduce emissions and increase sustainability, but they are unlikely to be sufficient in and of themselves.

Among the tools Texas localities should consider are:

- Using power purchase agreements (PPAs) to provide consistent, predictable support for new renewable energy development;
- Prioritizing location-specific, local renewable energy projects; and
- Creating programs to support energy efficiency and energy storage.

Governments can implement those tools through a variety of mechanisms, including municipal or county purchases of clean energy, clean energy procurement by municipal utilities, or bulk purchasing programs through which cities or counties negotiate clean, cost-competitive renewable energy plans that they can make available to their residents.

Introduction

Local governments in Texas, from the big to the small, are lining up to be part of the shift to an energy system powered by renewable energy.

Houston, Texas' biggest city, has already achieved its 2025 goal to use 100% renewable electricity in municipal operations, and is working to be carbon neutral by 2050.[9] And Harris County, of which Houston is the county seat, hired consultants at the end of 2021 to help develop a plan to use other mechanisms to support renewable energy development besides purchasing renewable energy credits.[10] San Antonio also aims to be carbon neutral by 2050 and intends to use renewable energy as a tool to achieve that goal.[11] Dallas has set a goal to achieve zero emissions of greenhouse gases by 2050, and Austin is working toward 100% carbon-free electricity by 2035 and net-zero emissions citywide by 2040.[12] Both Austin and Dallas plan to make renewable energy generation a centerpiece of their efforts.[13]

And it's not just Texas' biggest localities that are taking leadership: smaller municipalities are also setting bold climate and renewable energy goals. For instance, the city of Denton – which has a population of just under 140,000 – set a goal in 2018 of contracting for 100% of the city's energy needs with renewable energy by 2020, and expected to receive renewable energy equal to its electricity demand in 2021.[14]

But setting a bold renewable energy goal is just step one. The next step is figuring out how to meet it.

Cities with municipal utilities can implement a 100% renewable energy target directly by purchasing only power generated from renewable sources. But cities and counties served by investor-owned utilities need to look for other tools – such as bulk purchasing programs for renewable energy.

One of the most common ways to show commitment to clean energy is through the purchase of renewable energy credits, or RECs.

This white paper reviews the pros and cons of RECs as a tool for encouraging renewable energy development and explores other tools and mechanisms that municipalities and counties in the Lone Star State can use to hasten the transition to 100% renewable energy.

What are renewable energy certificates?

Renewable energy certificates (RECs), also known as renewable energy credits, are financial instruments used to represent the "renewable-ness" – or the environmental benefit – of electricity generated from renewable sources.[15] RECs can be sold separately ("unbundled") from the electricity with which they were originally associated.[16] An entity that "retires" a REC – or takes it out of circulation – is legally allowed to claim the use of that amount of renewable energy, even if they are buying electricity from the normal grid.[17] RECs are uniquely identified, and their exchange and retirement are tracked to ensure proper use.[18] The Electric Reliability Council of Texas (ERCOT) runs the REC program for the state.[19]

Where did RECs come from?

The idea of separating the environmental benefit of renewable energy from the electricity itself first arose in the mid-1990s in planning for the implementation of California's renewable electricity standard.[20] The idea reappeared in 1997 in New England, during discussions about how to enforce environmental disclosure rules for energy, and the first retail REC product was offered by Massachusetts-based AllEnergy Marketing Company the next year.[21]

In 1998, the electricity markets in California, Massachusetts and Rhode Island were opened to retail competition, and in 1999, the Automated Power Exchange in California began selling "green tickets," which bundled the environmental benefits of renewable energy with wholesale power purchases.[22] In the same year, Texas adopted Senate Bill 7, which deregulated the electricity market, adopted a renewable electricity standard, and resulted in the first REC trading program in the U.S.[23] The national Green-e certification standard for REC products, managed by the Center for Resource Solutions, was adopted in early 2002 after a series of stakeholder meetings.[24]

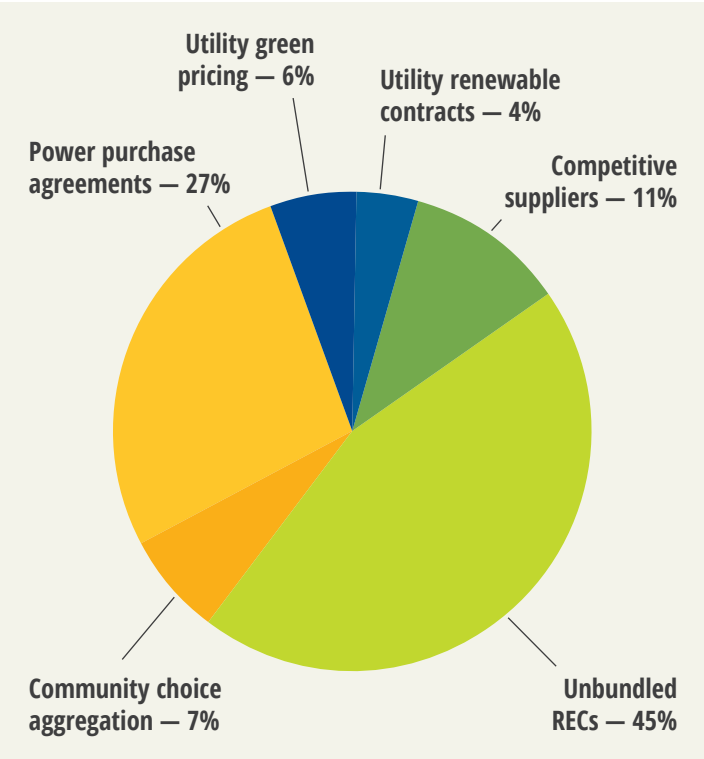

Figure 1. Sales volume percentage of voluntary green power purchases by mechanism, U.S., 2020[28]

RECs are the dominant tool for procuring renewable energy in America's voluntary clean energy markets – the markets separate from compliance with states' renewable electricity standards, and of which cities' and counties' renewable energy purchases are a piece – accounting for 45% of the total renewable electricity procured voluntarily in 2020, according to the National Renewable Energy Laboratory (see Figure 1, p. 4).[25] Commercial and industrial entities were responsible for the majority of those REC purchases.[26] In terms of the number of customers served by voluntary renewable energy purchases, however, the vast majority were served by community choice aggregation purchases.[27]

The strengths and limitations of RECs as a tool for achieving 100% renewable energy

What are RECs good for?

RECs, whether purchased to facilitate compliance with legal mandates or purchased voluntarily, provide important financial support to renewable energy projects. RECs are among several policy and market tools that have facilitated renewable energy's remarkable transition from a set of relatively expensive, fringe technologies two decades ago to the cheapest, fastest-growing source of energy today.

RECs have played two particularly important roles in that transition:

Helping support renewable energy development. Selling RECs can give renewable energy developers an extra source of revenue that can help with financing or add additional income.[29] This is especially true of long-term contracts for RECs, which provide certainty for investors and developers and often involve higher REC prices than do short-term purchases.[30] Demand for RECs is a market signal that there is demand for renewable energy, which helps the industry and makes new renewable energy development easier and more likely.[31]

Providing a platform for tracking renewable energy purchases. Renewable energy certificates have been a useful tool in allowing states, utilities and companies to track compliance with state laws or voluntary goals about spending or use of renewable energy.[32]

- Currently, 30 states, Washington, D.C., and two territories have active renewable energy standards (also called renewable portfolio standards), which require that a certain amount of energy generated or consumed comes from renewable sources.[33] Many of those goals have been expanded or strengthened over time.
- Over 180 cities and more than 10 counties across the United States have committed to using 100% renewable energy, according to the Sierra Club.[34]
- Hundreds of companies globally have committed to 100% renewable electricity and use REC purchases as a mechanism for achieving that goal.[35] Other companies voluntarily purchase renewable energy (and RECs) without adopting goals to do so, and programs like the Environmental Protection Agency's Green Power Partnership have served to promote and support such activities.[36]

What are the limitations of RECs?

RECs have been useful in helping to facilitate the transition to renewable energy, providing a mechanism to support development of renewable energy and to track both the development and the support.

Today, however, wind and solar projects are often financially competitive with fossil fuels, and prices are

continuing to fall.[37] While the financial support provided by RECs can still be important for some projects, renewable projects are increasingly moving forward not just because they are clean, but because they make financial sense.

Achieving a transition to 100% renewable energy, however, requires more than just building wind turbines and solar farms. It requires moving that energy from the places where it is generated to the places where it is used. It requires reducing demand on the grid to lighten the burden of the clean energy transition. And it requires investing in energy storage to enable renewable energy to power Texas even at times when the sun isn't shining or the wind isn't blowing.

Simply purchasing the cheapest available RECs on the market (as opposed to buying RECs from specific projects and/or through long-term contracts) does not address these challenges. Specifically, REC purchases often don't or can't:

- **Support local renewable energy projects.** Utilities, companies, individuals or other entities seeking to claim the purchase of a certain amount of renewable electricity can purchase the cheapest RECs available on the spot market, even if the generation facilities are geographically remote.[38] Short-term contracts or non-contracted REC purchases (which often mean lower REC prices) mean less revenue certainty for renewable energy projects and less ability to expand the use of renewable energy on local grids.[39] Local sources of renewable energy don't rely on long-distance transmission, reducing the energy losses that occur as power is transmitted over hundreds of miles from the location where it is generated to the place where it is used. Transmission networks can also become congested – preventing new clean energy from being added to the grid quickly. In Texas, a huge amount of renewable energy capacity has been built in the western part of the state, where wind and solar resources are ideal.[40] Recently, however, new projects have been delayed or canceled, and existing generation facilities sometimes sit idle, because transmission capacity has been strained, leading to curtailment even during times of peak demand.[41]
- **Drive renewable energy development.** Cheap, easily available RECs are a signal of a good problem: a lot of renewable energy. But that situation can also reduce the benefits RECs bring: if RECs are abundant and cheap, they will offer less revenue for renewable energy developers trying to finance new projects.[42] At the same time, other revenue streams tend to be much larger, especially in Texas. For instance, as compared to Texas wind REC prices of less than $1.00 per MWh – which was their value on the spot market between mid-2014 and mid-2020 (see Figure 2, p. 8) – wholesale energy prices in the ERCOT market averaged $38 per MWh in 2019, $22 per MWh in 2020, and between $20-$50 per MWh in 2021.[43] That means that REC prices of a few dollars per MWh are a small piece of the total revenue stream of a renewable energy project.
- **Support high-value technologies.** The transition to 100% renewable energy will require a range of technologies and strategies, some of which RECs were not designed to support. For instance, RECs (including those authorized by ERCOT, which regulates most of Texas' electricity market) were created for renewable electricity generation specifically and do not include energy efficiency programs or energy storage technologies.[44] In the transition away from fossil fuels, many everyday technologies that use energy will become electrified (e.g., furnaces replaced with heat pumps), and energy efficiency is crucial to limit the increase in demand for electricity and to reduce the amount of new renewable generation capacity needed.[45] Similarly, energy storage will be crucial for smoothing the intermittency of wind and solar energy, and for providing many of the grid services that fossil fuel generation does currently.[46] To support those important pieces of a renewable energy system, cities and counties will need to use more than RECs.

The current state of RECs in Texas

Texas has a huge amount of renewable energy generation capacity, which is made up primarily of wind energy, though there are many solar projects under development.[47] In fact, between 2001 and 2020, Texas increased its wind and solar generation more than any other state and, in 2020, was the nation's top producer electricity from the wind and sun, at more than 100 terawatt-hours.[48] A lot of that renewable energy creates RECs as it produces power.[49]

Though REC sales help renewable energy projects on the edge of financial viability get built, historically, REC prices have been quite low in Texas, averaging under $1.00 per MWh for five of the last seven years (see Figure 2). That clearly hasn't stopped the explosive growth of renewable energy in the state, but the relative prices of wholesale electricity and RECs indicate that RECs are not the main financial driver of renewable energy development.[50] On the flip side, the low price of RECs has allowed consumers affordable access to renewable energy through their electricity rate plans: a REC that costs $1.00 per megawatt-hour (MWh) equates to $0.001 – one tenth of one cent – per kilowatt-hour (kWh), or 1.3% of the per-kWh cost of the cheapest rate available on Power to Choose, a website allowing Texans to compare electricity plans available to them.[51] That means REC prices increasing a few dollars per MWh would barely increase electricity bills for consumers.

Right now, RECs in Texas are used by a number of different kinds of entities. Texas utilities, retail electric providers, municipal utilities and electric cooperatives use RECs to meet the state's renewable portfolio standard (also called a renewable energy standard, or

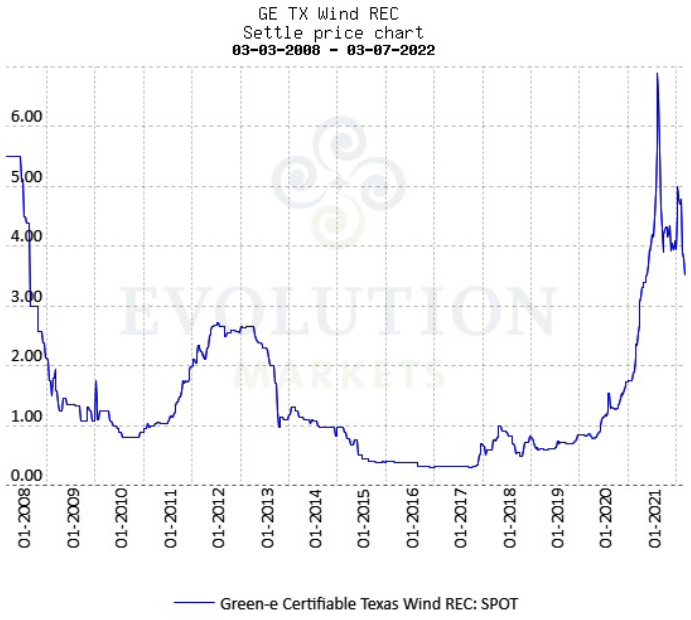

Figure 2. Average Green-e certified Texas wind RECs prices on the spot market over time, dollars per MWh.[52]

RES), which sets a goal for developing new renewable energy generation capacity.[53] The standard was set in 1999, increased in 2005, and hasn't been updated since, despite the state meeting its 2025 total renewable generation capacity goal of 10,000 megawatts (MW) in 2009.[54] Texas also set a voluntary 500 MW non-wind renewable capacity goal for 2015.[55] Texas has nearly four times the 2025 capacity goal in wind power alone, and has over 20 times the non-wind capacity goal with just solar power.[56]

Businesses buying RECs do so on the "voluntary" market because they're meeting goals they set for them-

selves rather than meeting legal requirements.[57] These voluntary purchases have recently become a big enough piece of the REC market that they are actually driving up Texas REC prices, which jumped to highs of $7 per MWh for wind RECs and $9.50 per MWh for multi-year solar REC contracts in summer 2021.[58] That price increase also raised the price for RECs used to comply with the state's RES, since RECs are often sold to both markets, though prices began to fall in late summer 2021, and were around $3.50 per MWh in March 2022 (see Figure 2, p. 8).[59]

RECs are also one tool that retail electricity providers can use to obtain renewable energy for the clean energy plans they sell to individuals and institutions.[60] While the RECs are an additional cost on top of the electricity, they are not driving up the price of power. A review of the rate plans available to consumers in Texas, available through the state's "Power to Choose" website, showed that prices for 100% renewable energy plans are generally not significantly more expensive than plans with low renewable energy content and, in fact, are often cheaper.[61]

Specifically, of the 14 categories of rate plans (grouped by contract length and whether the plans were time-of-use rates, pre-paid, or fixed or variable rates) that had at least one 100% renewable option and one non-100% renewable option, the median price for the 100% plans was lower at all usage levels than the price for the least-renewable plans in nine categories, and more expensive in only three categories, with mixed results in the remaining two categories.[62]

Finally, some Texas localities are using RECs to work towards achieving their climate and sustainability goals. Dallas, for instance, purchases RECs to match 100% of its municipal energy use, as it has since 2017.[63] Both Houston and the broader Harris County have also used RECs to support renewable energy.[64]

Recommendations for Texas local governments to go 100% renewable

Texas localities, large and small, are setting ambitious climate goals, including zeroing out greenhouse gas emissions, which will require a transition to renewable energy. But complying with clean energy goals on paper is not enough. To truly make an impact, cities and counties should do their share to move themselves, the state of Texas, and the nation toward 100% clean renewable energy.

Local governments can begin the transition to 100% renewable energy with their own **municipal or county energy use.** Government-owned offices, ports, airports, and other facilities can represent a big source of demand for energy and can also play host to renewable energy generation. Equipping public buildings and land with clean energy technology and purchasing renewable energy for local governments' own use can make a meaningful difference and set a positive example for residents. Building out local, distributed generation capacity with energy storage and the ability to isolate from the grid can help cities and counties keep essential services, like hospitals and fire stations, operational during disruptions on the larger electricity grid.[65] Making energy efficiency improvements can further support the continued functioning of essential services during emergencies or outages.

Cities with municipal utilities can go even farther – planning for and moving toward a future in which they supply their residents with 100% renewable electricity while incentivizing energy efficiency, energy storage and improved grid resilience. Austin, for example, has ambitious plans that include phasing out the use of existing fossil fuel-powered generators, installing more renewable energy generation capacity, and investing in energy efficiency, demand response and energy storage programs.[66] Austin is also aiming to expand community solar programs in the city, allowing residents who may not be willing or able to own their own solar panels to nonetheless support local renewable energy generation.[67]

Cities and counties can also offer residents a 100% renewable electricity plan – and provide other services alongside it – using municipal/county **aggregation and community bulk power purchasing.** Entities like local governments are allowed to form or contract with a company to form an aggregator to buy electricity in bulk, and could then negotiate for more renewable energy, often at lower prices, while helping residents with things like weatherization, bill assistance, and assistance in adopting distributed clean energy sources such as solar panels.[68] Local governments can also permit and support community renewable energy programs, such as community solar programs, which encourage local clean energy development and allow community members to support renewable energy even if they cannot own it themselves.[69]

REC purchases can be a part of local governments' efforts to spur the transition to renewable energy, but maximizing impact in terms of adding renewable energy to the grid will require cities and counties to do more.

Some other useful mechanisms Texas local governments can use include:

- **Power purchase agreements (PPAs).** Power purchase agreements involve an extended contract for electricity – in this case electricity generated from renewable energy – bought at a fixed price.[70] Often, that price is set below the current wholesale price for power, meaning purchasers save money as long as the wholesale price stays higher than the set price.[71] With a physical PPA, power (and RECs) from a specific generation facility is purchased at a fixed price.[72] With a virtual PPA, the purchaser pays the renewable generation facility owner a fixed wholesale price for the power (and RECs), the purchaser continues drawing power from the grid as normal, and the facility's power is sold into the wholesale market, with the price difference between contract price and wholesale price determining how much the purchaser makes.[73] PPAs are excellent tools to be used in combination with aggregation and bulk power purchasing, as they allow local governments to contract with, and ensure the development of, new renewable electricity generation capacity.[74]

- **Prioritizing location-specific, local projects.** By streamlining permitting and approval processes, implementing incentives like partial tax abatements, or prioritizing purchasing RECs from local projects, local governments in Texas can encourage local renewable energy development. A lot of the renewable generation capacity in Texas is located in the north and west parts of the state, far from population centers.[75] Cities and counties requiring REC purchases to be local will spur more development closer to demand. By virtue of being close by, local development will also help minimize energy lost in transmission, as well as the need for new transmission capacity (which has its own environmental impacts) that would be required in order to connect to new, distant generation facilities. That lowers the barrier for new renewable energy generation capacity to clean up the grid. As an added bonus, local renewable energy development can also bring in substantial new property tax revenue to local governments (and direct payments to local landowners), as has been the case in Texas and elsewhere in the United States.[76]

- **Including energy storage and energy efficiency programs.** Cities and counties should create incentive programs for energy storage and energy efficiency, to be offered either independently or through a community bulk power program.[77] Both energy storage and energy efficiency technologies can improve grid reliability and reduce demand, helping achieve 100% renewable energy more quickly and more easily.[78]

Texas local governments have set ambitious climate and sustainability goals and should do everything in their power to meet them. Transitioning to 100% renewable energy should be a piece of that effort, and localities should make use of the many tools available to ensure that as much new renewable energy generation capacity as possible is added to the grid as quickly as possible, and to make the transition as smooth as possible.

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