NRG.COM

BUNDLING COMPETITIVE SUPPLY AND DISTRIBUTED ENERGY RESOURCES



A new strategy for Texas businesses to achieve better pricing by leveraging resource flexibility

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Executive Summary

Texas businesses often pursue one of two distinct energy strategies. One approach focuses on competitive supply, which can offer low and predictable rates. The other encompasses distributed energy resources (DERs), such as backup generators, energy storage, or microgrids, which are technologies that enhance energy reliability and sustainability. Businesses may even use these resources in demand response programs to create additional revenue streams.

Pursuing either approach — competitive supply or DERs — makes sense. But managing them separately does not, and may leave money on the table.

In this paper, we will describe a more effective way, a cohesive and flexible energy strategy that bundles and coordinates your supply and DERs. Managing these resources together achieves benefits beyond their individual values.

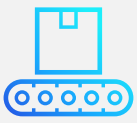




Your business may have flexible resources that you might not necessarily think of as DERs,



An experienced supplier can undertake a range of strategies to manage electricity supply with DERs; some involve accruing revenue, others offsetting costs.



The supplier may also use DERs to target specific aspects of a facility's utility bill,

Understanding the market

To help understand this strategy, let's take a quick look at two different product structures and how they work.

Businesses contract for power on the retail level under pricing options that suit their risk tolerance. For example, if your company values budget predictability, you may choose a predetermined, fixed rate.

It's important to note that while the rate is fixed for you, the retail customer, it's not fixed for your electric provider. Your provider procures the power on the wholesale level, where electricity is a commodity subject to price fluctuation. While your rate is consistent, your provider's costs can increase dramatically behind the scenes if a solid hedging strategy is not in place to mitigate increases in power prices.

How much might prices rise? Consider what happens on a hot summer day when the air goes still and wind farms stop producing power. As the amount of power availability drops, prices can escalate, jumping, at times, from $30/MWh to the market cap of $9,000/MWh, a 300x increase.

This happened on August 11, 2019. And, it could happen again, given that wind energy makes up a sizable portion of power in ERCOT, as illustrated below.

Some businesses choose to assume an element of this market risk. Rather than buy power at a fixed price, they enter into contracts that are indexed to the market. These businesses can capture an upside should prices come in low, but also face risk if prices are high.

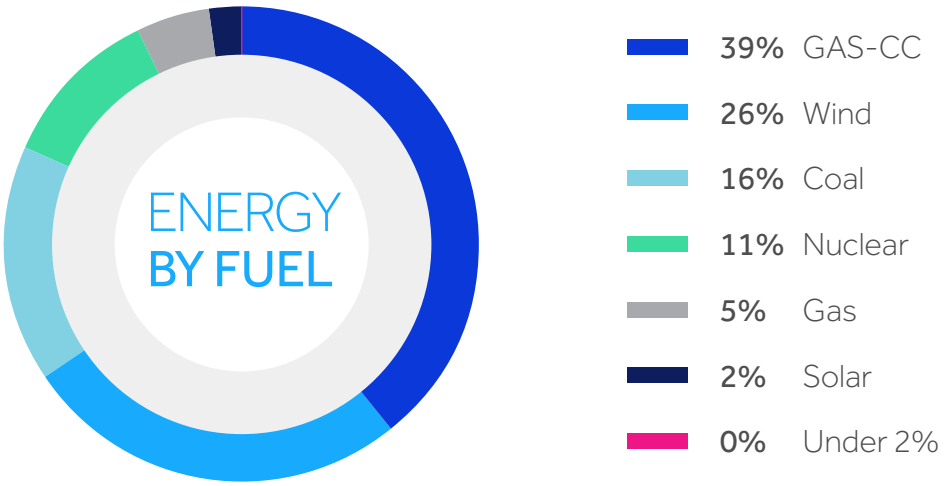
Just as suppliers put in place strategies to mitigate against high prices, customers, too, should consider strategies that hedge against price spikes if they are on an indexed product with exposure to high prices. A coordinated supply and DER strategy accomplishes this by allowing businesses to quickly change how they use power during periods of high prices.

What steps should you take now so that you are ready to employ a coordinated supply and DER strategy?

First, check with your supplier. A sophisticated provider, one offering its customers supply and access to economic market-based DER programs, will be well-versed in risk mitigation strategies and can advise you on your options. Second, learn about the benefits DERs offer, beyond those you hear about often, such as electric reliability and sustainability. Gaining a better understanding of DERs will help you evaluate strategies recommended by your supplier.

Before we explore coordinating supply and DER strategy, let's examine DERs and why they are key to an effective price mitigation strategy in Texas.

Energy by fuel for 2020



Credit: ERCOT

What you need to know about DERs

When most people hear the term "DER," they think of solar panels, storage, or back-up generators. All of these technologies provide power on or near the premises they serve. This is why DERs are sometimes referred to as local energy. DERs stand in contrast to "centralized generation," large power plants that transmit electricity to many energy users across long distances on the grid.

A key benefit offered by DERs, one not often discussed, is flexibility. DERs can be turned on and off quickly as conditions change. So, they can inject power onto the grid when demand rises because of extreme heat or for lack of wind to power wind farms.

It's important to note here that not all DERs produce power; instead they may save energy. For that reason, energy efficiency and load reduction technologies also qualify as DERs.

In fact, DERs encompass a broad array of systems and technologies, both physical and virtual. **Your business may have flexible resources that you might not necessarily think of as DERs,** including water heaters, EV charging stations, refrigerators, elevators, and large lighting banks. We categorize them as DERs because they offer load flexibility (the ability to modify a customer's electricity consumption).

DERs are energy-intensive systems that can generally be controlled or turned off and on to strategically manage your energy load at crucial times.

DERs describe not only types of technology, but also the application of technology. For example, a business that is able to lower its air conditioning settings during a peak demand period (i.e., has a smart thermostat) has a DER that can be optimized.

Common types of Distributed Energy Resources

DER is an all-encompassing term for a wide array of different technologies. Here are just a few common examples:

- **Renewable energy:** Typically, rooftop solar, ground–mounted solar panels, geothermal systems, or small-scale wind turbines.
- **Fossil fuel generator:** Natural gas or diesel-fueled generator sets (gensets) sized for local energy production.
- **Combined heat and power (CHP):** Units that convert the waste heat from their electricity production into usable steam, heat, or hot water.
- **Fuel cell:** A cell that produces electricity from a chemical reaction rather than combustion.
- **Energy storage:** Most commonly, lithium-ion batteries that absorb energy and discharge it when needed.
- **Electric vehicle charger:** EVs' (cars, trucks, forklifts, etc.) rate of charge can be modified to lower charging costs or serve a need for power on the grid.
- **Controllable load:** Responsive HVAC systems, intelligent hot water heaters, banks of elevators, nonessential machinery, refrigerated warehouses; any large electricity load that can be modulated when needed.
- **Microgrids:** Multiple distributed energy resources located behind the customer meter at a single point of interconnection to the local distribution system. Microgrids can be placed in island mode, which allows them to keep electricity flowing to customers during a power outage. A microgrid can be part of a single building, or cover an entire campus of a university or a commercial/industrial park.
- **Virtual power plant:** Multiple geographically dispersed resources (often batteries) that are connected through software. Separate buildings, each with their own battery storage systems, could provide supply or demand from various points on the grid at the same time, having a bigger impact together than they would individually.



How DERs create value

DERs can be designed to operate connected to the grid or independently. In the U.S., they typically are grid connected, unless they are sited in highly remote locations, such as on islands. Some, like microgrids, can switch back and forth between a grid connection or independent operation.

The grid connection is vital to gain maximum value from DERs in Texas. Through use of smart controls, software and algorithms, businesses with sophisticated DERs can manage price by responding to internal indicators and external grid signals.

An experienced supplier can undertake a range of strategies to manage electricity supply with DERs; some involve accruing revenue, others offsetting costs.

For example, the grid may need a sudden injection of power and will pay DER owners for the service. Or, a savvy supplier may undertake a strategy to leverage DER use against grid pricing. In simple terms, when grid prices are high, the business will use its onsite resources or reduce its consumption (or a combination of the two) and reduce its purchase of the high-priced grid electricity. Conversely, at times when power costs are low on the grid, sophisticated DER systems ramp down and produce less power — or perhaps charge their batteries — so that the business can instead purchase the lower-cost grid electricity.

The supplier may also use DERs to target specific aspects of a facility's utility bill, such as demand charges or time-of-use rates. By using advanced load controls, onsite generation or stored energy, DER systems can help businesses avoid these costly charges and better match their consumption to the most affordable energy available each day.

In addition to price management, DERs offer several other benefits, among them:

Energy reliability/resilience: Onsite backup generation, energy storage, and microgrids are types of DERs that can provide onsite power for a business during a grid outage.

Self-sufficiency: For some businesses, it will make sense to provide as much of their own power as possible to save money and ensure sustainable onsite energy. Or, they may require onsite power because they cannot access the central grid. These DER systems will typically include generation and storage capabilities with advanced controls, and they are able to operate independently from the electric grid for extended periods of time, if not indefinitely.

Sustainability: Businesses can achieve sustainability goals many ways. For example, using onsite generation they may produce and consume their power in close proximity, which improves efficiency because it diminishes electricity loss that occurs as it travels over transmission wires. Onsite generation — particularly renewable energy like wind, solar, and geothermal — provides sustainable options for businesses. Companies can consume as much of the clean energy onsite as possible and then sell some, or all, of the excess back to the grid, if local net metering rules allow.

Grid resilience: On the rare occasion when demand exceeds supply on the electric grid — as occurred in California in August 2020 — DERs act as resources that ease pressure on the system. In doing so, they help avert rolling blackouts. At these times microgrids might generate power and sell it to the grid. Or they might provide power for host buildings so that those buildings do not put more strain on the overtaxed grid. Sometimes DERs act as backup when lack of wind or solar energy creates supply shortfalls. When DERs play this role, they make conditions more favorable for future renewable energy development. They help assure that the grid will stay in balance even as renewables become a greater part of the supply mix.



How combining supply and DERs provides value

A sophisticated provider will employ a range of energy strategies, including an approach that leverages DER flexibility with a business's competitive supply. This may involve common DERs, like batteries and solar, as well as controllable loads.

A common DER strategy involves demand response. Many businesses are already aware that the ERCOT marketplace, and individual utilities and energy suppliers in Texas, offer demand response. These programs reward businesses financially for using their DERs to lower consumption during peak periods.

What some might not know is that programs also exist that can help lower the cost of power supply when it is bundled with DERs. A sophisticated energy partner will bring a supply contract into the mix and leverage incentive programs so that they further reduce your supply costs. For example, they may recommend a 4CP program to help reduce transmission costs for businesses with flexible load.

This, of course, all requires a deep understanding of energy supply contracts, wholesale markets, DER technologies, smart energy strategies, and your company's energy consumption needs and patterns. As sophisticated as your team is, this is probably a lot to tackle on your own. As we explain below, partnering with an energy solutions provider can make it much easier.



Next steps

The Texas grid is a competitive platform where businesses can select their own energy providers and still have electricity delivered to them over the same grid used by everyone else. Businesses are able to choose supply based on the criteria that matters most to them, whether that be price, sustainability, or other metrics.

Adding to the complexity, businesses also can choose from an array of DERs, which allows them to take their energy strategy to the next level of cost management.

While this sounds complicated, **an expert energy provider can simplify the process** for you and assist in making the best decisions for your company.

The provider will help you determine and procure the type of contract best for you, whether the price is fixed or indexed to the market. Equally important, a sophisticated provider understands DERs and can:

- Create a strategy that leverages your supply contract and DERs
- Identify DERs you already have onsite and those you may want to add
- Help you secure financing. In some cases, businesses can install DERs without making any capital investment or taking on operational and ownership responsibility

The bottom line is that whatever options you choose, they should bring maximum value to your business. You can best achieve that by finding a supplier skilled in competitive markets and DERs — and in the art and science of managing these resources together.

As one of the largest suppliers in Texas and a national leader in DERs, NRG is uniquely suited for this task. We bring to the table decades of market experience and a deep understanding of all aspects of DER management — from energy efficiency through distributed generation and energy storage. Let us help you capture the full price benefits of your flexible resources — before prices rise again. Contact us for more information about how we can partner.

About NRG Energy, Inc.

At NRG, we are redefining power by putting customers at the center of everything we do. We create value by generating electricity and serving over 3 million residential and commercial customers through our portfolio of retail electricity brands. A Fortune 500 company, NRG delivers customer-focused solutions for managing electricity, while enhancing energy choice and working towards a sustainable energy future. More information is available at nrg.com. Connect with NRG on Facebook, LinkedIn and follow us on Twitter at @nrgenergy.

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