

A RETREAT FROM ELECTRIC COMPETITION

How A Texas Capacity Market Will Lead to
Expensive Subsidies, New Regulations and Higher Prices

A SPECIAL RESEARCH PROJECT BY



Texas Coalition
for Affordable Power

&

CSO
Steering Committee
of Citizens Served by Choice

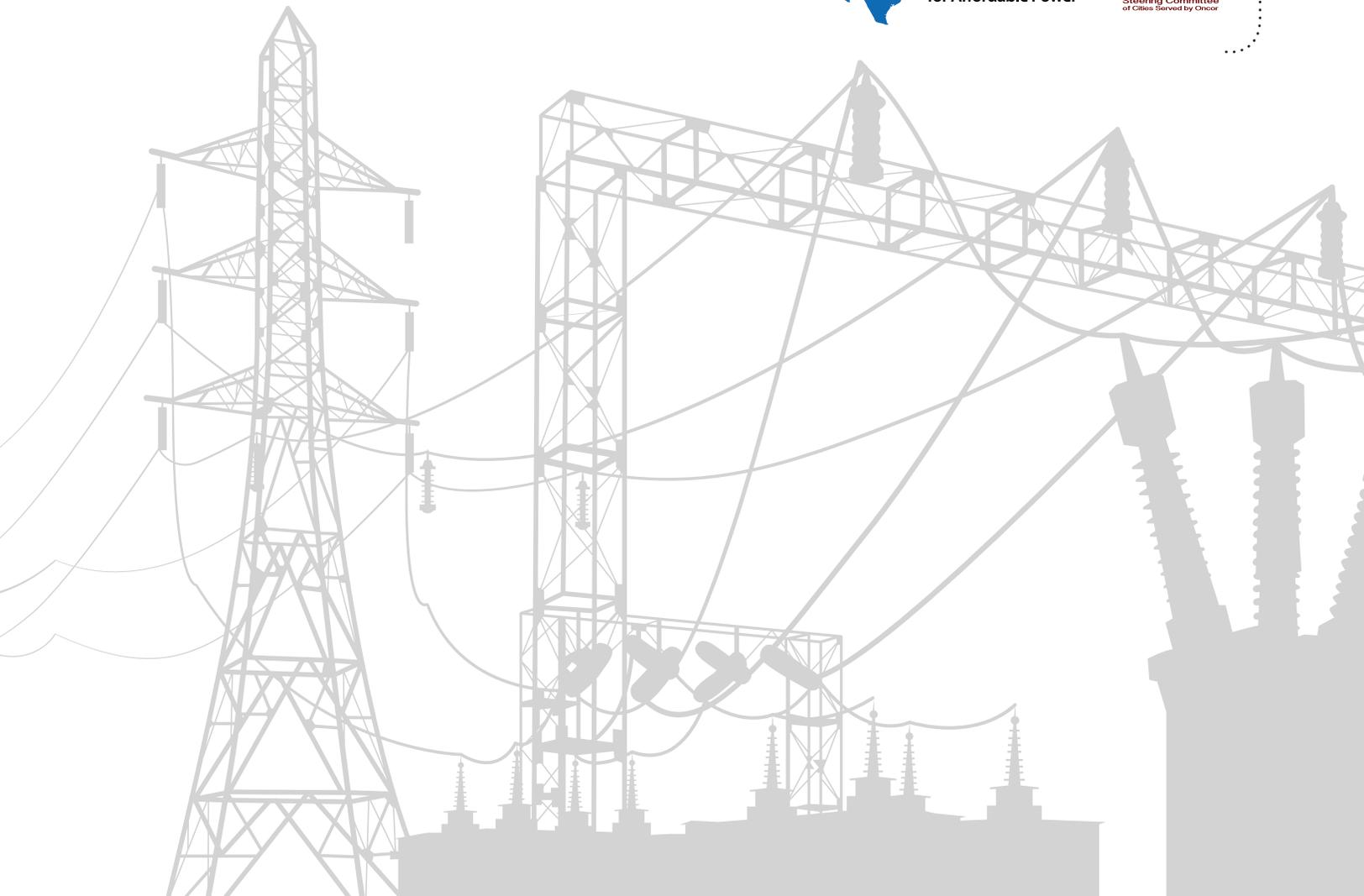




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Executive Summary and Overview

A multi-billion dollar debate rages in Texas — a debate that has captured the attention of those at the highest levels of government and industry. Yet at the center of this heated controversy are two words that may mean nothing to most Texans: [Capacity Market](#).

What is a capacity market and why should anyone care? Some argue that a capacity market will help safeguard the state against electricity blackouts, which can have serious economic consequences. But a capacity market also means more involvement by regulators, more rules, and more costs to consumers. At the very least, creating a capacity market would mark the biggest change to the Texas electric market since deregulation began more than a decade ago.

The Texas Coalition for Affordable Power (TCAP) and the Steering Committee of Cities Served by Oncor (CSO) offer this policy guide to help readers understand the ongoing debate, and the conclusion of our organizations that a capacity market is wrong for Texas. This report provides a historical overview, explains key issues and enumerates policy alternatives.

FINDINGS INCLUDE:

- Annual electricity costs could increase by billions of dollars each year under a capacity market. By their very design, capacity markets contribute to higher electric prices.
- Capacity markets in other states have not worked well. Even those who stand to gain the most financially from a capacity market in those regions — the generation owners — have noted serious challenges.
- Many of the calls for a capacity market have been premised on speculative and historically inaccurate technical projections and rare extreme weather events.
- Authorizing capacity subsidies would mark a significant departure from the free market principles under which Texas deregulated its electricity market.

A Retreat from Electric Competition: How a Texas Capacity Market Will Lead to Expensive Subsidies, New Regulations and Higher Prices is based on extensive review of regulatory proceedings and journalistic accounts. This report includes a Policy Overview section (page 5), a section outlining the history of the debate (page 10), and explanations of key concepts (page 3). Key take-away facts from this report are included at the end (page 17). Recommendations (page 18) and a discussion of policy options (page 19) are also included.

About Texas Coalition for Affordable Power

The Texas Coalition for Affordable Power, a non-profit political subdivision corporation, enjoys a unique vantage point within the state's deregulated electricity market. Originally two separate non-profit corporations — the Cities Aggregation Power Project and the South Texas Aggregation Project — TCAP pools the resources of its more than 160 member political subdivisions to purchase electricity in bulk for the needs of local governmental authorities.

TCAP members purchase in excess of 1.3 billion kilowatt hours of power each year for street lighting, office buildings, water plants and other municipal needs. An increase by even a single penny in electric rates can cost cities millions of dollars — money that can impact municipal budgets and the ability to fund essential services. High electric prices also can impact the welfare of city residents and businesses. TCAP wants what all Texans want: a fair and efficient system for delivering electricity.

About the Steering Committee of Cities Served by Oncor

The Steering Committee of Cities Served by Oncor and its predecessor organization (the Steering Committee of Cities Served by TXU Electric) have been representing the interests of electric consumers for more than two decades. Formed in 1989 to provide cities a united front at the Public Utility Commission, the Steering Committee over the years has helped save Texans more than \$1 billion.

The organization began its work with the representation of consumers during the PUC's regulatory review of construction costs of the Comanche Peak Nuclear Plant. The Steering Committee later negotiated a sweeping deal with the North Texas electric utility relating to certain costs associated with electric deregulation, and has represented consumer interests in rate cases. The non-profit coalition also represents the interests of municipalities and their citizens at the Electric Reliability Council of Texas, which oversees the state's power grid.

Key Concepts

Although many of these terms may seem unfamiliar, they nonetheless form an important part of the ongoing debate on the affordability and reliability of electricity in Texas.

ENERGY ONLY MARKET:

Although there are some exceptions, for the most part generators in Texas receive payments only for the electricity they generate — and nothing more. In regulatory parlance, this is called an “energy only” market because generators receive payment only for the energy they produce. This dynamic — receiving money only for the products that are sold — is common to free commodity markets.

CAPACITY MARKET:

A different sort of wholesale energy market — a “capacity market” — exists in northeastern electricity markets. There, generation companies receive payments both for the energy they sell and for the generation plants they own. These extra payments are called “capacity payments.” Although the details vary, capacity payments usually are received in a future year in which the generator commits to having operational a specified amount of plant capacity. The more generation capacity a company possesses, the more money it can collect in capacity payments.

RESOURCE ADEQUACY:

The debate over a Capacity Market closely relates to the concept of “resource adequacy,” which is defined as the ability of an electric system to reliably meet the demand for electricity by customers. When resource adequacy requirements are met, customers should expect that the electrical grid will continue to operate reliably — that is, without blackouts. This should be the case even during high heat days, or when power plants are shut down for maintenance.

PEAK DEMAND:

Texans typically consume much less electricity in the middle of the night than they consume during a hot summer afternoon. Likewise, some days are warmer than others. “Peak Demand” is defined as the maximum amount of power used during any given moment. *Peak Demand* is measured in megawatts, where a megawatt is

approximately enough electricity to power 200 households during a hot day.¹ The current peak demand record (as of October, 2013) was set on Aug. 3, 2011, when Texans required 68,294 megawatts of power.²

RESERVE MARGIN:

In general terms, the “Reserve Margin” is defined as the amount of surplus generation on hand to guard against blackouts. In specific terms, the “Reserve Margin” is the percentage excess of total potential electrical output within a given system, and the projected *Peak Demand* in that system. Said another way, the reserve margin describes the relationship between how much power all generators can produce in a single instant and the predicted highest demand by all consumers. The “Reserve Margin” is expressed as a percentage.

RESERVE MARGIN TARGET:

The “reserve margin target” represents the quantity of generation reserves deemed necessary to ensure system reliability. Setting an appropriate *Reserve Margin Target* and the question of whether Texas will meet that target, are key challenges in the ongoing debate over *resource adequacy* and a *capacity market*.

SYSTEM-WIDE OFFER CAP:

To address the state’s *resource adequacy* challenges, the Texas Public Utility Commission has authorized an increase in the “System Wide Offer Cap.” This is a cap on the price for which generators can offer their electricity in the wholesale market overseen by the Texas power grid operator.

DEMAND RESPONSE:

Another way to address resource adequacy challenges is through “demand response,” which refers to the ability of electricity customers to voluntarily curb their electric consumption at the direction of the power grid operator, in response to high prices or pursuant to other kinds of programs.

ERCOT and the PUC:

The Electric Reliability Council of Texas, which is the organization that oversees and operates the state's main power grid, facilitates a stakeholder process that makes many decisions relating to *resource adequacy*. However, the most important policy decisions — such as whether or not to adopt a capacity market — will be made by the Texas Public Utility Commission, the state agency that oversees the state power market. The PUC also has authority over ERCOT and over rates and services of transmission and distribution utilities.

DAY-AHEAD MARKET:

Each day, ERCOT administers a wholesale market auction in which buyers and sellers can arrange their power supplies for the following day. This market is called the Day-Ahead Market.

Wholesale Electricity Markets: *Energy Only versus Capacity*

Texas operates a modified *Energy-Only Market*. This means that generation companies, with limited exceptions, receive payments only for the electricity they sell. In this regard, Energy-Only Markets are much like other free markets for commodities. Sellers receive payment only for what they sell. Buyers pay only for what they buy.

However, northeastern states operate *Capacity Markets*. Under these systems, generators receive extra subsidies in addition to what they would otherwise receive by selling electricity. These subsidies are called “capacity payments.”

In typical capacity markets, generators receive subsidies for power plants that are operational, regardless of whether they are actually producing electricity. The price for a unit of capacity is set through periodic auctions, which are governed by the regional power grid. Generators typically receive capacity payments in a future year, in which the generator commits to having operational a specified amount of plant capacity.

Other characteristics of capacity markets include:

- **New Government Mandates** — Entities that purchase wholesale electricity (such as retail electric providers) are obligated by government fiat to make capacity payments to generators. These payments are in addition to whatever would have been paid to generators for the electricity they sell.
- **Biggest Generators Become Biggest Winners** — Generators receive capacity payments that not only reflect the value of new power plant construction, but rather that reflect the value of all their operating capacity. All else equal, this means the largest generation companies are in line to receive the most in capacity subsidies. That is, generation companies receive capacity payments for their entire fleet of power plants, simply because the fleet exists.
- **Most Subsidies for Existing Power Plants, Not New Ones** — Although generation companies could reap billions of dollars each year in capacity subsidies, most of that money won't be for building new power plants. *This is because most capacity payments will reflect the value of existing power plants, not new construction.* Capacity subsidies may end up with shareholders or for any number of purposes unrelated to the state's resource adequacy challenges.

Policy Overview: Why Not a Capacity Market in Texas?

The market for retail electricity in most of Texas is deregulated. That means that residential and business customers can choose among different retail electric providers, or “REPs.” These REPs set their own prices for the electricity they purchase from deregulated generators. The price also includes the cost of REP payments to transmission and distribution utilities to deliver electricity to retail customers. Texans living in approximately 85 percent of the state receive power under such a system.

But just as there exists in Texas a competitive market for retail electricity, there also exists a competitive market for wholesale electricity. Many Texans may be only vaguely aware of the existence of this separate wholesale market, and yet its efficient operation is essential to the state’s economic welfare.

This wholesale electricity market for electricity looks much like other wholesale commodity markets. Buyers (mostly REPs) can contract with generators for a long-term supply of electricity at a fixed price, or buyers can obtain electricity on a more immediate basis in a commodity-style market. In theory, competition among generators keeps downward pressure on energy prices.

But not all wholesale energy markets are the same. Texas operates a modified version of an “energy-only” market under which generators, with limited exceptions, receive payment only for the energy they sell. Other regions have “capacity” markets, in which generators receive payments both for the energy they sell and for generation plants they own.

In recent years, many generation companies and some others have called for Texas to abandon its energy-only model and instead adopt a capacity market. The reasons cited relate to the concept of resource adequacy, i.e., the ability of the electricity system in Texas to reliably meet demand. Resource adequacy has long been a topic of behind-the-scenes debate at the PUC and ERCOT, but not until the historic hot summer of 2011 did it come to the attention of the wider public.

Although the details vary, in typical capacity markets generators receive additional money for plants that are

operational regardless of whether they are actually producing electricity. Entities that purchase electricity in the wholesale market make the capacity payments, which are in addition to whatever is paid for the electricity generators sell. The price for a unit of capacity is set through periodic auctions, which are governed by the regional power grid.

Generators note that generation reserves in Texas have declined in recent years, and argue that they will continue falling without regulatory intervention. They warn this could lead to future blackouts. Generators blame the drop in generation reserves on diminished wholesale energy prices, which they say have fallen to levels too low to incentivize needed plant investment. Therefore, the argument for a capacity market is premised on two interrelated concerns:

1. *Concern about generation reserves.* Generation reserves are declining in Texas and may eventually fall below the reserve margin target, which could lead to needless blackouts.
2. *Concern about wholesale energy prices.* The decline in reserves has been blamed on wholesale energy prices, which supposedly are too low to support needed generation investment.

In theory a capacity market, by delivering new subsidies to generators, would help address these concerns. Proponents argue that a capacity market in Texas will increase revenues for generators, which, in turn, will encourage additional generation investment and help the state meet its reserve margin target and avoid needless blackouts.

Implicit in these arguments is the idea that the Texas economy will suffer if blackouts increase. Therefore — so the argument goes — the creation of a capacity market will help the state avoid economic damage.

This report explores concerns relating both to 1) generation reserves, and 2) wholesale energy prices. There is also an additional section that addresses other policy implications raised by the creation of a capacity market.

1. CONCERN ABOUT GENERATION RESERVES

The reserve margin is a measurement, expressed as a percentage, of the state’s existing generation capacity beyond that needed to meet peak demand. An easy way to visualize this is to consider the minimum number of power plants Texas needs to serve its citizens and businesses on the hottest day of the year. Then envision the additional plants operating in Texas beyond that minimum. The reserve margin is a measurement of the output capacity of these additional plants. As such, the reserve margin is a useful gauge of system reliability. This extra cushion of capacity allows ERCOT to deal with unexpected events, like power plant outages. All else equal, higher reserve margins mean a lower chance of blackouts.

The reserve margin in Texas, which is measured as a percentage, has declined in recent years. Some fear it will continue declining to such an extent that it will drop below the target

of 13.75 percent, thereby placing the state at greater risk for blackouts. But to put these concerns in their proper context, one needs to understand several important points about the reserve margin and the reserve margin target.

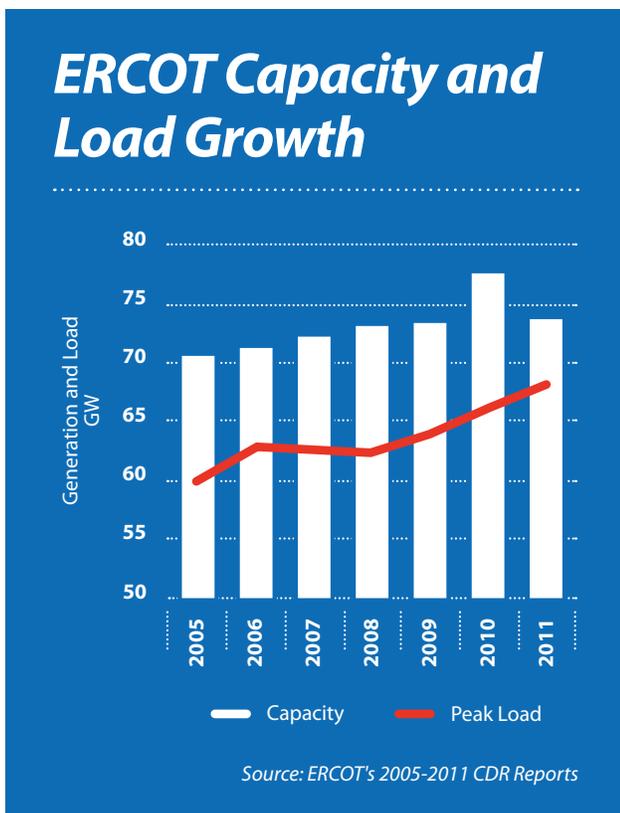
First, as a matter of policy, Texas sets its reserve margin target in such a way as to prevent more than one system-wide blackout event every decade. This is called the “1-in-10” standard, and similar standards are common in the energy industry. However, the Texas 1-in-10 standard is much more stringent — and much more expensive to meet — than the 1-in-10 standard in other jurisdictions. That’s because in Texas, the 1-in-10 standard is interpreted in such a way as to prevent more than one blackout event every ten years, no matter the duration of that event. By contrast, other system operators interpret the standards as attempting to avoid more than “24 outage hours in 10 years.”³

Second, what constitutes a “safe” reserve margin has changed. In 2002 Texas had a reserve margin goal of 12.5 percent. In 2010, that goal was increased to 13.75 percent.⁴ In 2013 there was a push to increase it again, this time to 16.1 percent. It has been estimated that increasing the reserve margin target to 16.1 percent would cost more than \$3 billion over 10 years.⁵ Where this target is set can have serious — and very expensive — policy implications.

Third, ERCOT’s reserve margin projections have consistently been revised upward from initial projections. For instance, ERCOT once forecast a reserve margin for the summer of 2014 of only 10.9 percent, well below the target. In May of 2013 ERCOT changed the forecast for 2014 to 13.8 percent.⁶ Earlier forecasts also missed the mark, with more generation than predicted consistently showing up. As one observer put it, “near-term reserve ‘crises’ that fail to materialize have been the rule rather than the exception in ERCOT.”⁷ [See the article on these ERCOT reports, on page 9.]

2. CONCERN ABOUT WHOLESALE ENERGY PRICES

The Independent Market Monitor of the ERCOT wholesale electricity market — a position authorized by the Texas Legislature in 2005 — releases periodic technical reports about ERCOT. The monitor (or the “IMM,” as the position is known in regulatory parlance) also makes pronouncements



that figure prominently in the resource adequacy debate.

One consistent message has been that average wholesale energy prices in Texas have been too low to support necessary power plant investment. In 2012, for instance, the IMM found that combined cycle gas plants were receiving only about \$42 per kilowatt-year, which was well below the \$105 to \$135 threshold necessary to support needed investment.⁸ In previous years the IMM had made similar findings, all of which pointed to an alleged “missing money” problem. This is the idea that the state’s deregulated wholesale market does not create sufficient revenue to support system reliability.

Capacity market supporters can rightly claim that a capacity market will deliver more revenues to generators. Indeed, that is the entire reason for a capacity market. But it is much less clear that a capacity market is the most efficient method of addressing the alleged missing money problem, especially in the long-term. Capacity markets are extremely expensive, and generators offer no guarantees that they will spend the multi-billion-dollar subsidies on new power plant construction.

How much would electricity costs increase with a capacity market? Under figures provided by UBS, a financial services firm, by up to \$2.2 billion.⁹ Another estimate puts the increase at \$3.6 billion per year. A study commissioned by energy

Falling Reserves: How Big a Risk?

Although the state’s reserve margin is lower now than it was when the state deregulated its electricity market, it has never dropped for any prolonged period below safe levels. Even in 2011, a year of repeated grid emergencies, the reserve margin had been deemed safe. It’s true that Texas suffered rolling blackouts during the winter of that year, but they were the result of technical failures and a lack of weatherization at power plants and not diminished reserves.²³

In July 2012, ERCOT’s out-of-state expert consultants on resource adequacy suggested that blackout concerns in Texas may be overblown. Speaking during a PUC hearing, Sam Newell, a principal of the consulting firm known as the Brattle Group, said that a somewhat diminished reserve margin would not dramatically increase blackout risks. With a 10 percent reserve margin, for instance, outages would increase by another 40 minutes per year per customer — even during a year with extreme heat and cold, he said.²⁴

“We are not talking about the doomsday scenario that we’ve seen described in the press that Texas is on the verge of having, you know, constant rolling blackouts — that’s just an extreme exaggeration,” said Newell.²⁵ He also noted that Texans already were accustomed to several blackouts per year, but on the more limited local distribution level.²⁶ Nationwide, the average U.S. electricity customer goes without power for

nearly two hours annually from outages often attributed to weather events such as wind and ice storms.²⁷

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— SAM NEWELL, BRATTLE GROUP PRINCIPLE

Ironically, those who stand to make the most money from a capacity market — generators — also have confirmed that the resource adequacy challenges in Texas may be exaggerated. Generation representatives made such assertions in Arizona, where an advocacy group affiliated with energy giant NRG said the outlook for “dire consequences” with respect to generation reserves in Texas “appears to be wholly overstated.”²⁸ In Texas, NRG has argued differently, warning of serious economic consequences if the state did not abandon its energy-only market.²⁹

giant NRG puts the cost of capacity subsidies at \$4.7 billion annually.¹¹ (A company-financed report claimed there would be offsetting savings, although the assumptions it used to calculate the offsets have been criticized.¹²) Whatever the figure, it's big. And all that extra money will benefit generators, at the expense of residential and business consumers. Much lip service has been given to the potential economic fallout from blackouts, but very little attention has been devoted to the economic fallout of a multi-billion-dollar annual increase in statewide electric costs.

The PUC so far has not conducted an extensive analysis to determine the potential consumer bill impact from such a dramatic market change, although lawmakers have called for such an analysis.¹³ A report released in 2012 by ERCOT found various policy advantages for the capacity market model, but also concluded that the most efficient long-term solution to the missing money problem may be a modified energy-only market.¹⁴ There are other options that — if implemented in a consumer-friendly fashion — make more sense economically. Some, such as the expanded pursuit of demand response, are described on page 19.

OTHER POLICY IMPLICATIONS

The ongoing debate over a capacity market in Texas also raises a number of other policy questions.

- The Independent Market Monitor identified 2011 and 2008 as rare years in which wholesale power costs were sufficiently high to incentivize needed investment in quick-start gas plants.¹⁵ But electric consumers experienced significant difficulties because of high prices in those years. In 2008, for instance, five retail electric providers failed financially and wholesale energy prices shot up nearly 37 percent.¹⁶ In 2011 (as noted earlier) a brutal heat wave drove up electric prices and resulted in repeated grid emergencies. These findings suggest that any response to the state's resource adequacy challenges should focus not solely on increasing wholesale prices, but also on alternatives that are beneficial to consumers.
- A capacity market would mark a step away from the free-market principles under which Texas deregulated its electricity markets. Andrew N. Kleit and Robert J. Michaels, researchers writing for the Libertarian-influenced Cato Institute, have noted

that no other competitive commodity market in the world relies upon capacity payments to remain viable.¹⁷

- The creation of a capacity market in Texas raises questions of basic fairness. For many years under deregulation, retail electric prices in Texas were at levels significantly higher than the national average. During these years many in the electric industry warned against any market intervention to relieve consumers. But with residential prices now subsidizing (the indirect result of declines in natural gas prices) generators now want subsidies — subsidies ultimately to be paid for by electric customers. In effect, generators are calling for retreat from the principles of the free market in order to enhance their profits. It's a heads-they-win, tails-we-lose vision of deregulation.
- Under a capacity system, retail electric providers in Texas would make capacity payments that benefit generators. This arrangement would create obvious competitive disadvantages for independent retail electric providers with no affiliation to generation companies. Why? Remember that all REPs under a capacity market system would face a government mandate to make capacity payments (the cost of which would ultimately be passed onto ratepayers). However, the parent companies of REPs affiliated with generation companies would receive an offsetting benefit. The benefit would be the capacity payments collected by their generation company. REPs not affiliated with generators would receive no such benefit. As one executive from an independent REP put it: "They (REPs affiliated with generation companies) have a severe conflict of interest — they can use that money to undercut me ... and others to the point where it's more difficult to do business."¹⁸
- Generation companies cite capacity markets in the northeast as justification for such a market in Texas. But the record of success of those northeastern markets is mixed, at best.¹⁹ Even generation company officials have raised issues about such markets. A top NRG official, for instance, has claimed that plant construction is nearly impossible for independent power producers throughout the country — even in states with expensive capacity markets.²⁰

Key Reliability Analysis Consistently Falls Short

At least twice a year, generally in winter and summer, ERCOT releases an analysis known as the Capacity, Demand and Reserves (CDR) report. The CDR forecasts both electricity demand and future supply. It lies at the heart of the ongoing debate over resource adequacy.

And the reports are frequently wrong.

Reviews by several outside parties³⁰ have shown that CDRs consistently overstate future peak demand, and consistently understate future generation growth. That is, the reports typically predict that Texans will consume more power than they actually do consume, and likewise predict less generation than that which actually shows up. As a result, the reports' energy reserve forecasts have been unrealistically pessimistic.

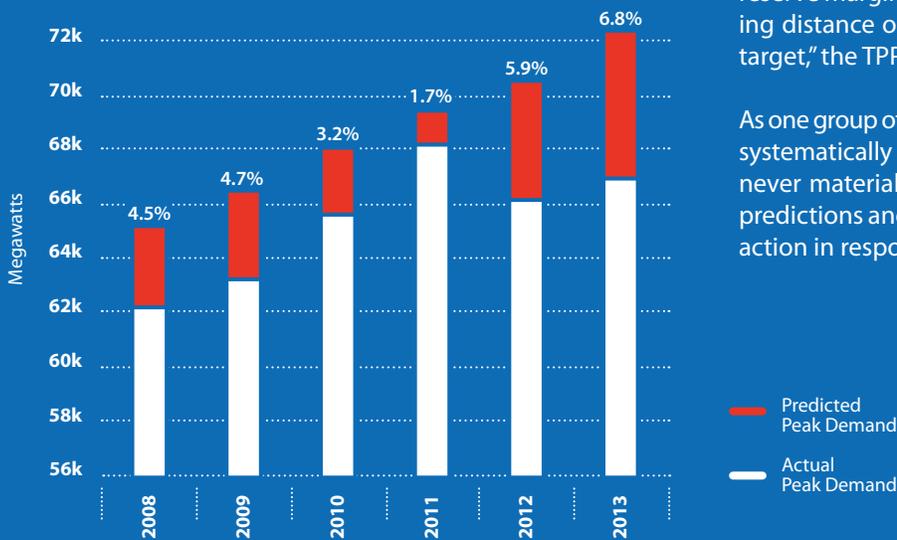
ERCOT has acknowledged the limitations and promises a revised report, due late in 2013, based on new methodologies. This is an important move, given the CDR's significance to the resource adequacy debate. Pointing to the CDRs, generation companies warn of future generation shortfalls and potential blackouts. They cite the CDRs in their lobbying efforts for multi-billion dollar capacity subsidies.

The reasons for the reports' unreliability do not relate to any malfeasance by ERCOT, but rather are due, in part, to not including assumptions for future generation construction beyond those projects that already have met certain of ERCOT's technical criteria. Generation projects seldom meet these criteria three or four years in advance of construction. As a result, the CDRs consistently under predict new generation construction beyond a three-year or four-year horizon.

At the same time, the CDRs simultaneously over-predict peak demand. A 2007 CDR forecasted peak demand in 2013 at 72,160 megawatts. In actuality, peak demand was 67,245— about 7% less. The 2008 CDR similarly shot over the mark. According to an analysis by the Texas Public Policy Foundation ("TPPF"), a free-market think tank, nearly 80 percent of CDR forecasts between 2008 and 2013 over-estimated peak demand. After correcting for the record heat and drought of 2011, the overestimation rate is 87 percent, according to the TPPF analysis.

TPPF conducted a separate analysis in which it adjusted for ERCOT's over-forecasting. Instead of showing shortfalls, the analysis shows healthy reserves for several years to come. "Whether or not the data from 2011 are included, reserve margins stay strong through 2019 — within striking distance or above the 13.75 percent reserve margin target," the TPPF concluded.³¹

As one group of industrial consumers put it, "The CDR report systematically over projects reserve margin shortfalls that never materialize — the market does not believe these predictions and [the] Commission should not take drastic action in response to these reports."³²



Source: ERCOT, including the REPORT ON THE CAPACITY, DEMAND, AND RESERVES IN THE ERCOT REGION (Winter Update) December, 2007

Resource Adequacy: A Texas History

Resource adequacy has been the topic of fretful debate by energy experts from the earliest days of electric deregulation. Ensuring reliability is a relatively easy task in regulated energy markets, which are subject to more planning and oversight. But in deregulated markets, competitive forces can punish investors who sink too much money in excess capacity. It is also much more difficult — if not impossible — to simply mandate new plant construction in deregulated markets.

Today, for a number of reasons discussed in the preceding section, the resource adequacy debate in Texas has become even more heated. The following historical review outlines the progression of the debate, and adds additional context with which to judge policy options now under consideration.

In 2001, Texas enjoyed the highest generation reserve margins in the nation.³³ This means that more than enough power plants operated in Texas to serve all of the state's electricity needs even during the hottest day of summer. According to the PUC, the state commanded up to 25 percent more generation capacity than was theoretically needed during peak-usage days.³⁴

This healthy reserve margin came as good news for those in Texas advocating for electric deregulation, which was scheduled for implementation the following January. California had recently deregulated its electricity market, and soon afterward its residents found themselves suffering blackouts and price spikes. But unlike Texas, California had low reserve margins. "We have the highest electricity reserve margin of any region on the entire continent," then PUC chairman Pat Wood III said in 2001.³⁵

But in the decade since deregulation, that 25 percent margin cited by the PUC in 2001 had dwindled to projected 14 percent in 2011.³⁶ This precipitous drop has raised questions for system reliability, economic efficiency and deregulation in general. Was the new system related to the drop? And are the reserve margins now too low, or more "correct" from an economic efficiency perspective?

Although such questions have been long debated at ERCOT and the PUC, the issues entered the public eye in a big way in 2011. It was during that year, in February, that a cold snap prompted ERCOT to order rolling outages and then later, during July and August, that a record heat wave

prompted ERCOT to call repeated grid emergencies. Major daily newspapers began writing about grid reliability, with long articles appearing in the *Dallas Morning News*, *The Houston Chronicle* and the *San Antonio Express-News*.³⁷

Through this press coverage, many Texans were introduced to the concepts of "resource adequacy," "peak demand" and "generation reserves." Texans also learned that their state operated a modified version of an "Energy-Only" market, under which generators typically receive payment only for the energy they sell. They also learned that the three-member PUC at the time was supporting the energy-only design, with chair Donna Nelson calling it "the envy of the world."³⁸

But readers also learned that capacity markets exist in the northeastern United States, and that this market design was favored by many big generation companies. "Generators like the guaranteed additional payments under that system, but they are passed along to consumers, raising energy prices," wrote one reporter.³⁹

To support their position, generators pointed to official predictions by ERCOT that capacity shortfalls could lead to blackouts — perhaps as early as 2012.⁴⁰ The Independent Market Monitor — a position created by the Texas Legislature to act as a watchdog of the generation market — also warned that average wholesale prices were too low to adequately support new power plant investment.⁴¹

In June 2012 the PUC released a report⁴² prepared by a

national energy consultancy known as The Brattle Group. The Brattle Report (as it would come to be known, see page 15) included a number of important findings about resource adequacy, and weighed the benefits of a capacity market versus other policy options. The consultants urged policymakers to exercise caution “about making major changes too quickly or without sufficient analytical support or stakeholder consideration.”⁴³ They suggested regulators may wish to revisit the standards under which reserve margin targets are set, and said the state could address its generation supply challenges with more robust “demand response” programs. [For more about demand response and Brattle report, see the articles on pages 15 and 16.]

During the same month the Brattle Report was released, the PUC also authorized a 50-percent increase in the offer price cap on wholesale electricity.⁴⁵ This was one of

the agency’s first decisive steps in addressing the state’s resource adequacy challenges. This cap limits the price at which generators can offer their electricity in the wholesale market overseen by ERCOT. The existing price offer cap was \$3,000 per megawatt hour, which already was the highest in the nation.⁴⁶ But under the June decision, generators were permitted to offer power at prices of up to \$4,500 per megawatt hour. This new cap allowed generators to sell their power at prices more than 100 times higher than normal.

The Commission reasoned that with the higher cap, generators would make more money and therefore build more power plants.

In November, the PUC agreed to phase in even more offer cap increases — to \$5,000 per megawatt hour in 2013, \$7,000 in 2014 and finally to \$9,000 in 2015.⁴⁷ A coalition of industrial customers found that a \$9,000 cap potentially could cost the state an additional \$14 billion annually under certain conditions. A separate analysis, using those same assumptions, calculated possible bill increases of \$48 to \$50 per month for an ordinary Texas household.⁴⁸ “These are staggering numbers and the impact of the Commission’s decision ... should not be trivialized or viewed as a purely academic exercise,” wrote an attorney for the Texas Industrial Energy Consumers.⁴⁹

At the same time, big generators continued pressing for a capacity market — with some suggesting Texas needed both high offer caps and a capacity market.⁵⁰ Such an arrangement would be unprecedented in the United States.

In February 2013, two organizations that typically oppose one another released separate reports opposing a capacity market. The Texas Public Policy Foundation, an Austin-based free market advocacy organization, stated in a February 6 report that “not only will a capacity market fail to address reliability concerns, but its costs will almost surely exceed any benefits it might bring.” Public Citizen, a consumer advocacy group founded by Ralph Nader, said February 12 that a capacity market would add billions of dollars to electricity costs without solving the state’s short-term generation problems.⁵¹

“the capacity market isn’t going to put more steel in the ground — it’s just going to put more money in the pockets of existing generators.”

— Senator Troy Fraser

Consultant Says Price “Not Relevant” to Debate

In October, 2012, Brattle group principal Sam Newell told a legislative committee that price was “not relevant to the choice that you have to make” relating to generation reserves, reasoning that costs would rise with whatever option was selected. A representative for large scale electricity consumers disagreed, saying that price was extremely important — and that not all options proposed by Brattle would have the same costs.⁴⁴ To date, the Texas Public Utility Commission has not conducted a cost-benefit analysis to determine the potential bill impacts of a capacity market.

In February 2013, then-PUC Commissioner Rolando Pablos announced his resignation.⁵² Commissioner Ken Anderson continued to insist that a capacity market was an extremely expensive solution to an infrequent risk of power shortfalls. “Do you suddenly go out and impose billions of dollars on costs to deal with about 1.8 percent hours of the year?” he said during one exchange with Ms. Nelson.⁵³ But Chairwoman Donna Nelson appeared to have moved away from her previous support for the state’s energy-only market, and so Mr. Pablos’ departure left the agency deadlocked on whether to abandon it for a capacity market.

A coalition of industrial customers found that a \$9,000 cap potentially could cost the state an additional \$14 billion annually under certain conditions.

The Texas Legislature convened in regular session during 2013, and several bills were filed relating to resource adequacy. One would have allowed cities to enter into public-private partnerships to develop small-scale generation projects — but only so long as those projects contribute to economic development and address resource adequacy challenges.⁵⁴ The legislation, designated House Bill 2692, was supported by the Texas Coalition for Affordable Power. Unfortunately, it failed to emerge from the House State Affairs committee.

State Rep. Sylvester Turner also proposed an important legislative amendment that would have required the PUC to conduct a detailed cost-benefit analysis before authorizing a capacity market. Turner’s proposal was characterized as “one of the most important pro-consumer amendments to be considered this legislative session” by a House lawmaker.⁵⁵ Unfortunately, Turner’s proposal did not make it out of the Senate.

However, state Sen. Troy Fraser made clear in the Senate his opposition to a capacity market, stating during a floor speech that “the capacity market isn’t going to put more steel in the ground — it’s just going to put more money in the pockets of existing generators.” Like other lawmak-

ers — both Republicans and Democrats — Fraser said the PUC should order a cost-benefit analysis before proceeding with a capacity market.⁵⁶

Sen. Fraser continued to engage in the issue after the conclusion of the legislative session, especially when a proposal was floated to increase the state’s reserve margin target. (Recall that this target represents the amount of generation reserves over projected peak demand that is deemed necessary to ensure system reliability — see Key Concepts on page 3.) Since 2002, the reserve margin target was 12.5 percent, but in 2010 that target was shifted to 13.75 percent.⁵⁷ Now some generation owners wanted to increase the target again, this time to 16.1 percent. Fraser helped convince policymakers to delay that decision, stating that “an increase in the target reserve margin of this scale could not help but serve the interests of those advocating for a capacity market, a system that would subsidize existing generation.”

The capacity market debate continued throughout the year — at the Public Utility Commission, at ERCOT, among interested market players and in the media. Some noteworthy opponents included representatives for independent retail electric providers, who said a capacity market would give an advantage to competitors affiliated with big generators.⁵⁸ A coalition of the state’s 50 largest industrial electricity users also announced their opposition. “We don’t want to create so many inefficiencies in the market that the distortions become hard to manage,” said Phillip Oldham, an attorney representing industrial users.⁵⁹

Generators — especially, the largest ones — remained the most ardent supporters of the capacity construct — but their message was not always consistent. For instance John Ragan, Gulf Coast region president of the energy giant NRG, expressed strong support for a capacity market in a June 2013 newspaper editorial.⁶¹ However another NRG official, CEO David Crane, suggested separately that economic conditions do not exist to support merchant plant construction elsewhere in the nation — even in those deregulated markets that allow capacity payments.⁶¹ Other generation owners also raised concerns about the effectiveness of capacity markets in other states.⁶²

In late August, NRG released a study showing that a capacity market would increase energy costs in Texas by \$4.6 billion annually, but that those higher prices would be offset by economic benefits. The Texas Industrial Energy

Consumers called the NRG study a “results-oriented analysis” that included unrealistically pessimistic assumptions for outcomes under an Energy-Only Market and overly optimistic assumptions for outcomes under a Capacity Market. “A cursory review of the ... report indicates that it set up a ‘straw-man’ ... and then calculated the cost difference,” the trade group asserted in PUC filings.⁶³

“an increase in the target reserve margin of this scale could not help but serve the interests of those advocating for a capacity market, a system that would subsidize existing generation.” — Senator Troy Fraser

In October 2013, during a special hearing on the issue, PUC Commissioner Anderson asked pointedly what the state would be buying by “imposing an energy tax” on consumers. He said many Texas businesses opposed the imposition of capacity market.⁶⁴ During the same hearing, an ERCOT official acknowledged its long-term forecasts for future energy reserves had consistently missed the mark and indicated the organization was revising its forecasting methodology. [See the article on ERCOT’s Capacity, Demand and Reserves report, on page 9] “This is a critical issue — it goes to the heart of whether we have a severe shortage or not,” said Anderson.⁶⁵

Later that same month, the Public Utility Commission signaled its intention to mandate a reserve margin, although it did not indicate at what level. Mandating a reserve margin would mark a dramatic shift from the state’s current practice of establishing only a target for a reserve margin. Many analysts interpreted the PUC’s call for a mandated reserve margin as a precursor to a capacity market.⁶⁶ A visibly angry Commissioner Anderson dissented from his colleagues on the decision, saying they were wrong to call for a mandated reserve margin without more analysis — especially without the updated Capacity, Demand and Reserves forecast expected from ERCOT in

December, and without an updated analysis from the Brattle consultants expected in early 2014. “We don’t know if we have an issue,” said Anderson.⁶⁷

It’s likely that the capacity market issue will continue to vex policymakers into 2014 and perhaps beyond. As one observer has noted, the question itself — how to find the missing money — “has created more market turmoil than any other debate in the state’s decade-old deregulated market.”⁶⁸

Natural Gas and the Missing Money Problem

In Texas, since the very earliest days of deregulation, natural gas has been the leading fuel for power plants. This is because natural gas has been historically inexpensive, and because it costs much less to build a natural gas-fired plant than to build a nuclear or coal plant. These factors have contributed to the development of a wholesale electricity market in Texas closely linked to natural gas prices.

As has been noted by PUC Chair Donna Nelson, Texas operates a market in which natural gas is “on the margin.” This means that increases in natural gas prices have made it easier to invest in other forms of electrical generation with lower fuel costs.⁷¹ “Owners and investors could justify the higher cost of the building of coal and even nuclear plants because the market allowed them to recover their all-in costs,” she wrote in a recent explanatory memo.⁷²

In recent years, however, natural gas prices have declined precipitously — and with it a related decline in wholesale electricity prices. Combined with the tightening of the capital markets and the economic downturn generally, these price reversals have contributed to what has been described as the “missing money” problem in Texas — that is, the idea that wholesale energy prices aren’t sufficient to finance new generation and allow profits that will satisfy investors.

What the Experts Say

DONNA NELSON, PUC CHAIR

"The actual reserve margin achieved by the energy-only market is uncertain and will vary over time. That is, there will be boom and bust cycles, and the reserve margin will vary based on where we are in those cycles at any given time. Through a forward capacity market, ERCOT market participants would be able to purchase the capacity necessary to achieve the desired level of reliability."⁷³

KENNETH ANDERSON, PUC COMMISSIONER

"ERCOT has been over-forecasting by about 1 percent — the outlook for dire resource adequacy is wholly overstated.⁷⁴ ... The real problem we have is 160 hours (per year). Do you suddenly go out and impose billions of dollars of costs to deal with about 1.8 percent of the hours of the year?"⁷⁵

ANDREW N. KLEIT AND ROBERT J. MICHAELS, ECONOMICS PROFESSORS

"The theoretical case for capacity markets is weak at best. Many of its arguments depend on oversimplified assumptions that are at variance with reality, particularly those that are necessary to produce the missing money phenomenon. ... An examination of ERCOT's current state does not provide coherent support for capacity market advocates."⁷⁶

JOHN RAGAN, PRESIDENT OF NRG GULF COAST REGION

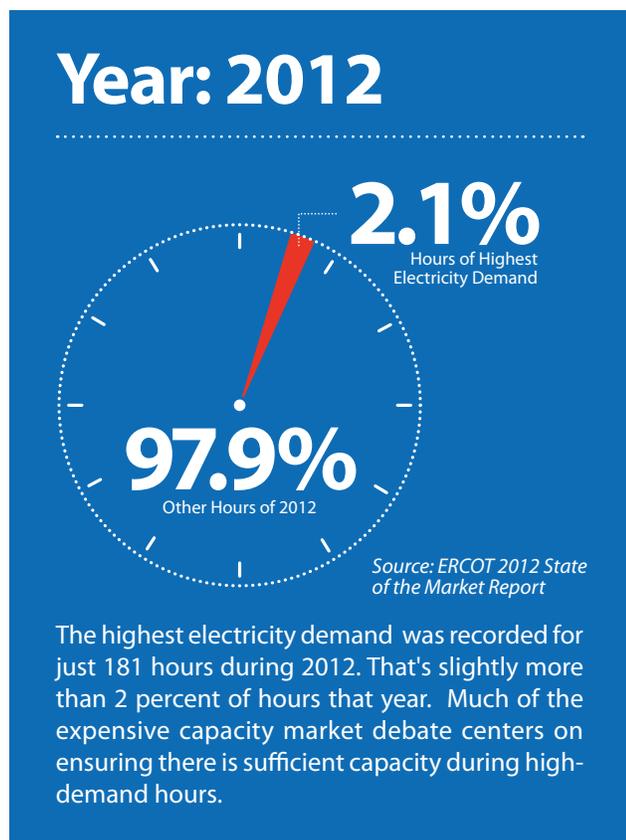
"A capacity market ... provides a solid foundation for continued Texas growth and prosperity. As our reserve margin dwindles, we face two choices: Hope for mild weather or move to a capacity market, which has brought new generation to electric grids in states across the country. Who wants to bet on the Texas weather? We don't. We support the capacity market option."⁷⁷

SAM NEWELL, PRINCIPAL OF THE BRATTLE GROUP

"At 10 percent (reserve margin), the worst possible weather — we are not talking about the doomsday scenario that we've seen described in the press that Texas is on the verge of having, you know, constant rolling blackouts. That's just such extreme exaggeration. I would find that not helpful. Forty minutes per customer per year. ... I don't want to belittle it. I'm just trying to state the facts from the analysis that these are the choices. ... It is 40 minutes of outages a year, in total, including all the events."⁷⁸

RICHARD NOLAN, ATTORNEY FOR H-E-B GROCERS

"H-E-B believes that a persuasive case for the adoption of an ERCOT forward capacity mechanism at this time has not been made, and that such a mechanism potentially could harm the Texas economy, and have adverse impacts on Texans as residential users. ... On a very basic level, the adoption of a forward capacity market would mean that consumers would incur an immediate increase in energy costs for all ratepayers. Those costs will be determined by administrative fiat rather than by market forces."⁷⁹



The Brattle Report

On June 1, 2012 ERCOT released a report⁶⁹ prepared by The Brattle Group — a national energy consultancy — on the state’s wholesale energy market. Brattle had been charged with analyzing the market’s ability to attract generation investment. Its most important findings include:

- ERCOT and the PUC should revisit the 1-in-10 year blackout standard, under which the state’s reserve margin targets are set in such a way as to avoid more than one major blackout every 10 years. ERCOT and the PUC have used this standard to justify a 13.75 percent target for reserve capacity. But ERCOT enforces a more stringent interpretation of the 1-in-10 standard than is employed elsewhere. That is, ERCOT interprets the standard to mean “1 outage event in 10 years,” while other system operators interpret it to mean “24 outage hours in 10 years.” These two interpretations may sound semantically similar, but in reality differ greatly: Brattle cited a case study in which the less stringent standard reduced reserve margin requirements by nearly 50 percent.⁷⁰ “The 1-in-10 standard is also poorly-defined with respect to the events it describes,” Brattle noted, explaining that the standard makes no distinctions between small-scale blackout events and widespread events.
- In ERCOT, the resource adequacy target implies average outages of less than 1 minute per year, per customer. But customers are accustomed to much greater outage times caused by disturbances in the more local electricity distribution systems. “During storm events, annual outages durations can reach several hundred to several thousand minutes per customer,” according to Brattle.
- As of the first half of 2012, the ERCOT market was not producing wholesale energy prices that were sufficiently high to maintain a 13.75 percent reserve margin. Increasing the offer cap on wholesale energy prices would stimulate investment, but at a level still insufficient to obtain that targeted reserve margin.
- Demand response — that is, programs under which customers can curtail their energy usage in exchange for a payment — could help meet the state’s generation supply challenges. However, it will take too long to create sufficiently robust demand response programs to meet the state’s near-term energy needs.
- A modified energy-only market could risk low reliability in the short term, but improved reliability in the long-term. Such a strategy also may have the highest economic efficiency over time — that is, Texans would get the best bang for their buck with regards to financing improved reliability.

The Brattle Report: Comparison of Policy Options

Source: ERCOT Investment Incentives and Resource Adequacy, Brattle Group, June 2012, Table 1 pg. 5

Option	How Reliability Level is Determined	Who Makes Investment Decisions	Risk of Low Reliability	Investor Risks	Economic Efficiency	Market Design Changes
1. Energy-Only with Market-Based Reserve Margin	Market	Market	High in short-run; Lower in long-run	High	May be highest in long-run	Easy
2. Energy-Only with Adders to Support a Target Reserve Margin	Regulated	Market	Medium	High	Lower	Easy
3. Energy-Only with Backstop Procurement	Regulated (when backstop imposed)	Regulated (when backstop imposed)	Low	High	Lower	Easy
4. Resource Adequacy Requirement	Regulated	Market	Potentially Low	Med-High	Medium	Medium
5. Resource Adequacy Requirement with Capacity Market	Regulated	Market	Low	Med-High	Medium	Major

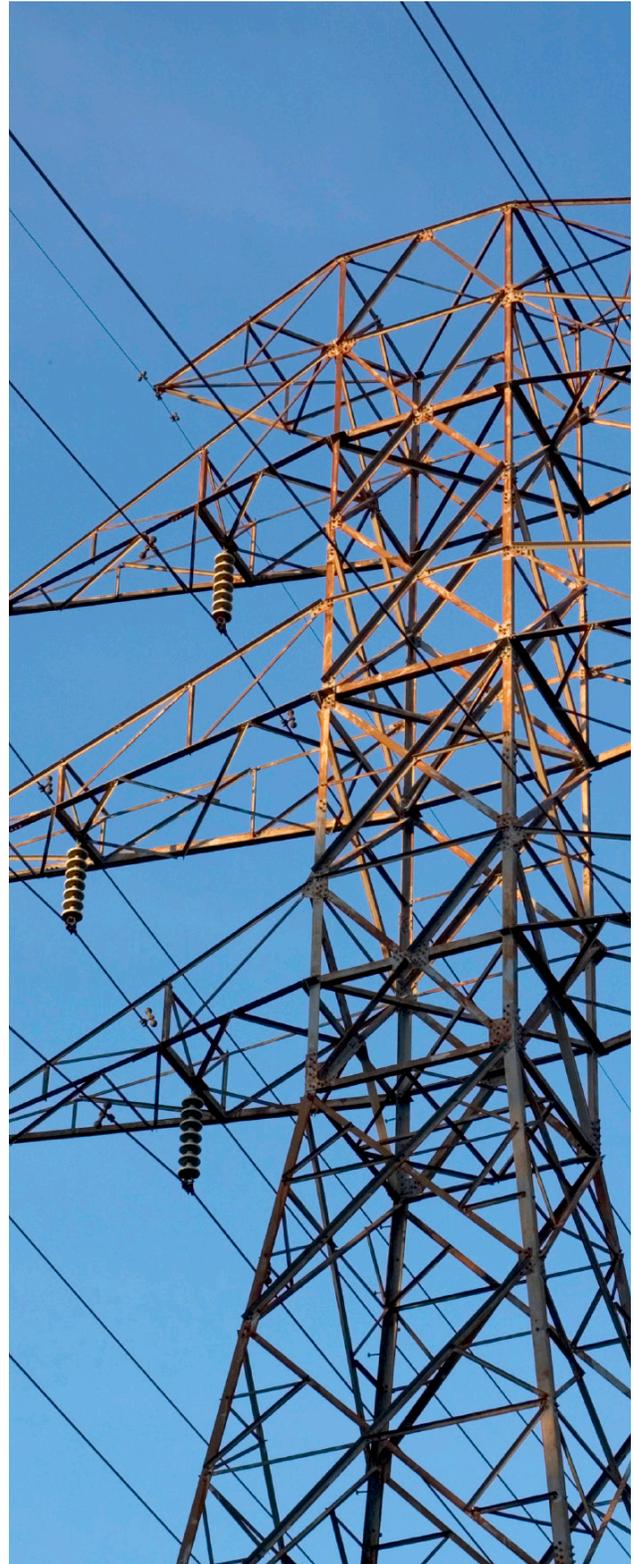
A report by a consulting firm known as The Brattle Group enumerated several policy options to address the state’s generation challenges. The chart, above, summarizes some of those options. Brattle also cautioned in the 2012 report against implementing changes without adequate analysis.

Key Take-Away Findings

- The state's resource adequacy challenges may be overstated, given that ERCOT projections for future generation capacity needs consistently have been overstated. At the same time, ERCOT has increased its reserve margin target, making that target more difficult to meet.
- By their very design, capacity markets contribute to higher electric prices. By one estimate, capacity payments to Texas generators could total nearly \$5 billion annually.
- Although generation companies could reap billions of dollars each year in capacity subsidies, most of that money won't be for building new power plants. This is because most capacity payments will reflect the value of existing power plants capacity, not new construction. Capacity subsidies may end up with generation company shareholders or for any number of purposes unrelated to resolving resource adequacy challenges.
- Capacity markets in other states have not worked well. Even generation owners — those who stand to gain the most financially from a capacity market — have noted challenges.
- Similar capacity markets do not exist for other commodity industries.
- Texas has a goal of permitting no more than one blackout event in 10 years. But this standard is much more stringent than standards in other jurisdictions, which typically reference one blackout day per decade. How this standard is defined can have serious implications for electricity costs.
- Electricity outages are not uncommon, especially on geographically limited scales. The average U.S. electric customer experiences more than one outage each year, and goes without power for about 2 hours every year.
- Authorizing capacity subsidies would mark a step away from the free market principles under which Texas deregulated its electricity market.
- Regulators have already taken aggressive action to address the state's resource adequacy challenges and have additional tools at their disposal other than authorizing the expensive subsidies under a capacity market.

Recommendations

- The Public Utility Commission and lawmakers should reject any proposal to create a capacity market in Texas. The PUC has already worked aggressively to address the state's reliability concerns. It's important to allow these changes to work.
- The consideration of consumer costs must be considered in tandem with considerations of system reliability. The Public Utility Commission should not adopt any further major change to the state's wholesale energy market without a detailed cost-benefit analysis.
- The Public Utility Commission and ERCOT should reject any proposal to increase the target reserve margin, currently set at 13.75 percent.
- Given its different interpretation in other regions, a 1-in-10 blackout standard should be reassessed to ensure it is interpreted in a manner that is appropriate for Texas.
- The PUC should pursue demand response strategies in such a way as to address reliability concerns without harming consumers.
- The Texas Legislature should adopt changes that make it easier for other parties — such as cities — to participate in the wholesale energy market to help address the state's resource adequacy challenges.



Policy Alternatives to a Capacity Market

Creating a capacity market in Texas is an expensive, inefficient response to the state's resource adequacy challenges. That doesn't mean, however, that Texas should ignore its resource adequacy challenges. Below is a description of four policy alternatives. Some of these alternatives have already been authorized by the PUC, while others are under review or contemplated.

1. INCREASING THE CAP ON WHOLESALE PRICE OFFERS

The Public Utility Commission in 2012 voted to phase in a number of significant increases in an already existing cap that limits prices in the wholesale energy market. This cap, known as the System-Wide Offer Cap, limits the price at which generators can offer to sell electricity in the wholesale market overseen by ERCOT. Prior to 2012, the cap stood at \$3,000 per megawatt hour (about 60 times greater than the typical cost of electricity). But in 2012 the PUC authorized a higher System-Wide Offer Cap, allowing it to first increase to \$4,500, then to \$5,000 and eventually to \$9,000 in 2015. According to an industrial power group, a \$9,000 cap would have increased the cost of wholesale power by \$14 billion if it had been in effect in 2011, a year of unseasonably high temperatures.

TCAP's and CSO's OPINION: Dramatically increasing the System Wide Offer Cap is a potentially expensive solution to the state's resource adequacy challenges, and almost certainly will increase costs to end-use consumers. However, this policy change already has been implemented and should be given time to work. TCAP and CSO note that some generators want the PUC to enforce both higher caps AND create a capacity market. This would be a one-two punch to consumers and should be rejected as a policy option.

2. INTEGRATE DEMAND RESPONSE INTO ENERGY PRICES

Technical changes underway at ERCOT may eventually give energy consumers greater incentives to curtail energy use during times of peak demand, such as during the hottest part of a summer day. These changes could lessen resource adequacy pressures in Texas.

The pending changes are extremely technical, and involve a complex computerized system at ERCOT known as the Security-Constrained Economic Dispatch program — or "SCED" for short. Under SCED, ERCOT picks the optimal mix of generation resources to meet electricity demand during any given five-minute interval, consistent with the transmission grid's capabilities. The SCED computer system sends electronic data signals to generation plants, instructing them where they should set their output levels during these intervals.

But as currently structured, the SCED system does not communicate with consumers. That is, the SCED system determines the most economic mix of resources to meet demand, but it does not consider electric consumers when making its calculations. The pending changes would allow large-scale industrial consumers, commercial customers, and groups of aggregated residential customers to receive payments in exchange for curtailing usage.

TCAP's and CSO's OPINION: If implemented correctly, these changes could provide additional revenue to electricity consumers, while also allowing consumers to compete with generators to meet system requirements. Hence, these changes potentially represent a pro-consumer, pro-free market response to the state's resource adequacy challenges.

3. GENERATION DEVELOPMENT BY MUNICIPALITIES

Some electric generation companies complain they lack sufficient financial incentive to build the new power plants needed to meet the state's peak energy needs. Cities, with lower borrowing costs, can help. How? Under a proposal developed by TCAP, a city or aggregation group of political subdivisions can use municipal bonding authority to develop small-scale generation plants. Such plants can be constructed relatively quickly and would have the quick-start capabilities needed to alleviate the state's resource adequacy challenges. The plants would be owned and operated by generation developers, but cities would take possession of energy output for governmental use. Cities also could receive additional revenues from power sold in the open market. Changes to state law would be required to facilitate such public-private partnerships.

TCAP's and CSO's OPINION: By partnering with private entities, cities can create new generation capacity for Texas, while simultaneously promoting economic development. Such public-private partnerships are a cost-effective way to address the state's long-term generation and reliability challenges. Public-private partnerships would enhance system reliability during periods of peak demand but would not contribute to higher electric bills.

4. ADJUSTING THE PRICING SYSTEM FOR STANDBY CAPACITY

ERCOT oversees a market under which generation companies receive payment for having backup power ready for quick deployment. This quick-deployment capacity sold by generators is known as ancillary services. As this market currently functions, prices can be suppressed when ERCOT first deploys ancillary services but then can shoot almost instantly to the system-wide offer cap. Under a proposed change green lighted by the PUC in September 2013, ancillary services prices can still rise to the system-wide offer cap, but in a more gradual fashion.

TCAP's and CSO's OPINION: Some advocates believe this new approach will help address the missing money problem because it reduces the price suppression effect, as described above. This approach eventually could encourage more demand response by reducing unpredictability and volatility in the ancillary services market. But these changes almost certainly will lead to an overall increase in wholesale energy prices. The details have not yet been worked out and until they are, it remains difficult to predict whether the benefits will outweigh the costs.

End Notes

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About The Author

Policy analyst R.A. “Jake” Dyer has spent the last 15 years monitoring consumer issues in Texas, its energy markets and ERCOT. His long journalism career included nearly a decade with the *Fort Worth Star-Telegram*, where he was named reporter of the year in 2007, and nearly a decade with the *Houston Chronicle*, where he was nominated for a Pulitzer Prize.

In 2011, Dyer authored *The Story of ERCOT*, a special research report on the Texas grid operator. In 2012, he authored *Deregulated Electricity in Texas: A History of Retail Competition*. His work with the Texas Coalition for Affordable Power and the Steering Committee of Cities Served by Oncor began in 2008.

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