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How Electricity Deregulation May Affect Water Utilities and Their Customers

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A recently-passed Texas law, which is part of a national trend, will bring about the deregulation of electrical utilities in the near future. Many experts feel that the new Texas regulation, Senate Bill (SB) 7, as well as changing national laws, may have widespread implications for water and wastewater utilities. As a result, many Texas water professionals are hastening efforts to learn more about SB7, so they will be prepared when restructuring is implemented in January of 2002.

At first glance, it may appear that utility deregulation has little to do with water utilities, but a closer look shows just how the two are intertwined.

The primary goal of deregulation is to potentially lessen the cost of electricity purchases. Backers hope that forcing power producers to compete may help keep a lid on prices and spur innovative technologies. Power is usually the second biggest expense for a water and wastewater utility (only behind labor). There may be an opportunity to substantially cut costs and to pass savings along to consumers.

There remains a scarcity of information about the extent to which, or even if, reductions in power costs may lower bills for water and wastewater treatment for consumers.

How could restructuring impact Texas? For starters, electricity sales in Texas are a big business ($17 billion in sales in 1998 or roughly 8% of the national total). The intent of deregulation is to lower all electricity bills — not just those related to water. One study suggests that Texas households pay an average of roughly 8 cents per kilowatt hour (about $1,080 annually) for electricity. Deregulation could lower those bills by as much as $300 per year.

Research by the Electric Power Research Institute indicates that electrical costs associated with pumping may account for as much as 85% of a typical water utility's distribution costs. Often, water utilities are the operation within a city or regional government which consumes the most power.

Restructuring may also increase the risk that the price water utilities pay for electricity may fluctuate. In a deregulated environment, some experts suggest that prices may become less stable. The risk will be shared by all parties involved — power generators, marketers, and the public. On the other hand, price variations for individual customers will initially be frozen and, thus, controlled.

Many utilities in Texas both generate and purchase power. Those utilities will have an opportunity to compete for customers in a deregulated marketplace, but will not be forced to participate. They will have to choose if they want to continue serving traditional customers or to market power throughout Texas. There is some anxiety that utilities which compete but fare poorly may see a loss of revenues. This may affect rates or the overall finances of a city

Why the Deregulation of Electricity Is Important to Water and Wastewater Utilities and Their Customers

• The cost to procure power is typically the 2nd biggest operation and maintenance expense for a water or wastewater utility. If these costs can be reduced, there could be an opportunity for significant savings.

• It is not known how much individual water and wastewater bills may be reduced, if at all, by electricity restructuring.

• There are no guaranteed cost savings for large customers, including water utilities, in Texas Senate Bill 7. Therefore, the volatility of the cost of purchasing power is likely to increase.

• Many public entities in Texas which are now involved in the water resources field (including cities, water districts, river authorities, and rural electric cooperatives) also generate, transmit, and distribute electricity. Each entity will have to decide whether or not it wants to compete and market power to others.

or water district, or could even result in the need for higher taxes.

In other states, once deregulation occurs, the market may become dominated by very large private companies. The result is that smaller, rural, power providers (mainly cooperatives) have expressed worries they may not be able to compete.

Already, efforts are being made to ready water resources entities for this new environment. The Texas Water Conservation Association (TWCA) sponsored two workshops to present strategies their members (municipal utilities and water districts) may want to pursue once deregulation occurs. This includes the idea that TWCA members may want to join together (or aggregate) to purchase power as a group.

Already, 21 states have passed comprehensive measures to restructure how electricity will be marketed to wholesale customers, including water utilities, as well as to individuals. Proponents of deregulation suggest that, in the near future, the purchase of power may resemble the breakup of the airline industry in the 1970s, with a resultant dramatic increase in competition and opportunities for cost savings. An industry newsletter notes that deregulation will provide water and wastewater utilities with "an opportunity to develop comprehensive and aggressive energy management plans" and with "the ability to maximize energy cost savings."

Ironically, those who are leery about the benefits of electricity deregulation also point to what has happened since the breakup of the telephone and airline industries. The difference is that they view restructuring as having negative consequences. They warn about the possibility of complicated multi-page bills, a constant barrage of solicitations from telemarketers, and the possibility that the reliability of service may be compromised.

Introduction

At the beginning of this century, federal and state agencies stepped in and regulated electricity providers. The goal was to lessen the possibility that monopolies could abuse the system by unfairly raising rates to high levels. Since, the political pendulum has shifted to such an extent that, today, the public is clamoring to make electricity competitive. The hope is that a deregulated market will benefit all.

At the most basic level, restructuring represents a dramatic departure from the way in which electric power has traditionally been bought and sold.

Under the existing paradigm, electric power is marketed through a regulated monopoly which is, in large part, closed to new entrants. Success for power-generating firms depends on doing well in legislative and rule-making arenas. Customers have a limited voice and utilities place little emphasis on retaining them.

In contrast, in the new regulatory environment, the emphasis is on passing and implementing laws that stress market competition and are driven by price. As a consequence, the marketplace will be open to a flurry of new entrants in power generation and transmission. Many companies are making tough choices about which part of the electricity business they want to participate in (generation, transmission, or distribution) and how to position themselves against competitors.

Understandably, many clients, including water utilities, fear the uncertainty associated with this new scenario. At the same time, many power-generating companies have postponed investing in new facilities while regulations are in a state of flux.

To really understand this new environment, one needs to know what the key players most want from a deregulated marketplace, says Susan Hersey, an analyst with Navigant Consulting. According to Hersey, ratepayers seek lower rates for power, enhanced services, and pricing schemes that can be tailored to their specific needs. Regulators want to introduce more competition and choice for consumers while, at the same time, lowering rates and bettering service. Power providers hope to be able to recover stranded costs (expenses incurred when power was fully regulated that may never be recovered) and an opportunity to compete and grow their business.

Background Information About SB7

The underlying guiding principle behind SB7 is that it deregulates power generation, as well as customer service and billing, and opens them up to competition. However, the transmission, and distribution of electricity will still be regulated by the Public Utility Commission (PUC).

The best way to envision how a deregulated electricity market will function is to consider how the various telecommunications evolved. An obvious impact of deregulation will be that separate companies will emerge that will compete for separate and "unbundled" components of the electricity industry including the generation and transmission of power. A new type of company (retail electric providers or REPs) will emerge, which will purchase power from generators and then market it to end users. An REP must be licensed by the PUC.

The bill calls for deregulation to be phased in gradually. Until January of 2002, utility accounts will be frozen and current electrical providers will maintain service to existing customers. During this period, utilities are required to mitigate and recover "stranded costs," which are financial obligations made during current conditions which would otherwise likely not be recovered. The extent to which Texas utilities have incurred stranded costs may be significant – a PUC report suggests that the amount of money lost through investments in nuclear plants may be roughly $4.5 billion. There is now a controversy over the extent to which industrial and residential customers should bear the brunt of repaying stranded costs.

From January 2002 to January 2007, residential and small commercial customers (less than 20 kilowatts) are guaranteed that electric rates will be cut by at least 6%, compared to prices paid in January 1999. By January 2002, utilities choosing to compete in a deregulated environment must "unbundle" services into separate companies – an REP, a power generation firm, and transmission and distribution utility.

It's important to note that the ability of individual consumers to choose a new electricity provider will be affected, in part, by the nature of service they now receive. Current customers of investor-owned utilities as well as people served by public utilities that decide to compete will be allowed to choose between a number of competing companies for service. However, customers now served by a city, cooperative, or other power generator which opts not to compete will not have a choice.

Many measures in SB7 are intended to bolster competition. The bill stipulates that no power generating company will be able to own more than 20% of the capacity to create power in a given region. Investor-owned utilities will be asked to auction some of their capacity to produce power.

Under the terms of SB7, no one will be left without an electricity provider. The PUC will designate a "provider of last resort" which will generate and distribute power to regions which no other companies have an interest in. At the same time, all power generators will be required to offer service to residential customers or face stiff fines.

SB7 includes provisions to safeguard the public interest. It requires that comprehensive efforts be made to educate the public. It provides a 10% discount in electricity rates for low-income residents, as well as mandatory savings for public schools. A unique provision of SB7 allows the Texas General Land Office to sell power to state agencies (including public colleges and schools) as well as political subdivisions.

Implications for Water Utilities

How should water and wastewater utilities prepare for the arrival of SB7? Many experts offer a few general guidelines. It's critical that utilities gather data on many aspects of how they use power, including detailed load profiles, energy efficiency, data about power use by specific processes, and whether there are opportunities to alter how and when power is needed. It may be feasible to modify the operations of a water treatment plant so that more processes are performed at night, thus shifting energy needs to times when demands and prices are low.

A strategy which is often proposed for utilities to reap the greatest benefits from deregulation is to aggregate loads. Aggregation is simply a strategy in which groups of customers increase their influence and buying power by joining other power purchasers with complimentary load profiles or metering capabilities. An aggregation can consist of as little as two members or large groups of users within the same industry or geographic area. For those purchasers who choose to aggregate, some of the most critical data that needs to be obtained includes information about annual and monthly energy consumption.

Although it seems that the most significant savings will often likely accrue to users of large blocks of power, a study from California suggests that agricultural water districts may also be in an ideal position to benefit. The ideas is that it may be desirable to aggregate the low-electricity use patterns or irrigation districts with other water users.

There are critics who are skeptical of the benefits of aggregation. Some leaders in the field suggest the greatest savings may accrue when individual power purchasers develop detailed information about their individual power needs and then find a tailor-made supplier. They argue that, when a diverse group of users aggregate, many potential site-specific benefits may be lost when individual usage traits are merged with others.

How could deregulation influence the cost water utilities pay for electricity? A good rule of thumb is that roughly 25% of a water or wastewater utility's operations and maintenance expenses can be attributed to power costs. Assuming the amount of funds spent to buy electricity could be cut by 10%, a recent report projects that annual savings could be as high as roughly $1.7 million for the City of Dallas and $500,000 or more in four other major Texas utilities. Another recent analysis suggests the cost for water utilities to purchase power may be reduced by a wide margin (5% to 20%) in a deregulated environment.

According to a recent study published by the Texas regional office of the Environmental Defense Fund (EDF), SB7 may have the side benefit of encouraging the use of "green" and renewable energy strategies. The bill sets goals for reducing pollution from older power plants, while requiring that such renewable sources as wind and solar be developed. It is not clear if hydropower is designated

Key Provisions of Texas SB7

• The generation of electricity, as well as customer service and billing, will be opened to competition beginning in January 2002. The transmission and distribution of power will still be regulated by the PUC. As a result, many wholesale and individual customers will be able to choose among many vendors for these services.

• Residential and small commercial customers are guaranteed a 6% rate cut through January 2007.

• Utilities will be given an opportunity to recover "stranded costs." In most cases, these are situations in which energy generators built plants (mainly nuclear) which may not be cost-competitive in a deregulated environment.

• Many consumer protection measures are built into SB7, including requirements for public education, assistance for low income families, and provisions that rural, remote areas must be serviced.

• Environmentally-friendly "green" energy sources (especially wind and solar power) are promoted. A goal is to develop 2,000 MW of green power generation by the year 2009. It is unclear if SB7 regards hydropower as a green energy source.

• State agencies, public schools, and other political subdivisions will be able to obtain electricity through the Texas General Land Office.

as an environmentally friendly power option in this bill. SB7 requires that an additional 2,000 megawatts of renewable power must be provided by the year 2009.

Interestingly, deregulation of electric power in Great Britain fostered the development of green power and led to cuts in carbon dioxide emissions of roughly 20%. Also, anecdotal evidence suggests that some environmentally conscious consumers may be willing to pay more for renewable energy.

The Effect on Power Providers

According to many studies, a trend associated with restructuring is that there may be fewer providers, but those who remain will have significantly greater assets. In 1995, the top five providers in the nation had revenues ranging from $6.5 to $9.6 billion. By 1999, the earnings of the top five power generators had jumped to $12.6 to $20.2 billion. The lesson seems to be that, in order to compete and win, electricity generators will have to become big enough to offer bulk savings.

Currently, generators of electricity in Texas include more than 75 cities, nine investor-owned utilities, and 85 rural electric cooperatives. Investor-owned utilities sell the most power (82%), followed by municipalities (10%), and co-ops (8%).

Concerns about whether electricity deregulation is a good thing for rural power generators and their customers have been voiced by members of Texas Electric Cooperatives, Inc. (TEC). TEC leaders point out that the rates they charge for power are already efficient and, in many cases, lower than prices set by many investor-owned utilities. It is anticipated that a few co-ops may opt to compete in the deregulated environment. It should also be stated that the TEC ultimately endorsed the final version of SB7, noting that it contains critical consumer safeguards, while creating a framework for meaningful choice for consumers.

The Impact on Consumers

Individual consumers will also be affected by restructuring.

First, in virtually all cases, individuals will have an opportunity to decide whether they want to stay with existing power generators and distributors or choose a new provider.

In addition to choosing a provider of electricity, deregulation may allow individuals to decide what level of risk they are willing to take in exchange for a lower rate. For example, in some areas, customers may be offered interruptible power, which costs considerably less than standard rates.

The bill sent to individuals will contain much more detailed information about the cost of individual components of electric service. The idea is that consumers will be enabled to make better informed choices as more information is presented to them.

Under SB7, Texans will be protected from "slamming" (when a service provider is changed without first getting the customer's consent) and "cramming" (charging individuals for services they did not request).

Saving Money with SCADA

Many experts suggest that the use of supervisory data control and acquisition (SCADA) systems and related technologies may help water utilities cut power costs. The idea is that the utility will be in the best bargaining position when it knows the most about its power consumption trends.

In basic terms, SCADA systems are used to acquire data about specific water use trends. Data obtained through SCADA technologies can then be incorporated into software programs which optimize energy use or which consider water quality parameters along with power consumption.

A 1998 report published by the American Water Works Association Research Foundation (AWWARF) reports on efforts to quantify the extent to which SCADA systems may reduce costs. Results of a case study which tested a SCADA-based energy and water quality management system suggest that as much as a 20% reduction in cost may be achieved by altering the operating schedule of pumping and treatment plants. The key is to change high energy-consuming processes to the times of the day when the lowest rates for electricity are available. The report outlines the cost of developing and implementing this technology for a major California utility.

The application of SCADA technology for use by water utilities has been the focus of ongoing research and development by PowerWare Solutions, Inc. (PSI), an information technology firm based in College Station, TX. Since 1994, PSI has worked with the City of Irving, TX to carry out pilot studies of the firm's "WaterSuite" software. The result has been a 14% savings in electricity costs.

SCADA systems designed specifically for water utilities should be able to help managers better understand power price structures, convey cost information in real time, allow a water plant to rapidly send anticipated power loads data to energy providers, and facilitate the continuous monitoring and exchange of data. The use of these technologies may allow utilities to develop comprehensive, detailed, profiles of historic use as well as forecasts of short-term water demands.

In the near future, new SCADA-related technologies may include features to anticipate and react to changes in water quality as well as hydraulic loads.

Experiences to Date

Although restructuring is only in its initial phase, some activities are already taking place in Texas and throughout the United States.

A preview of how electricity deregulation may occur in Texas is now being provided through two pilot projects conducted by the Texas–New Mexico Power Company (TNMP), Bryan Texas Utilities (BTU), and the small Texas

communities of Gatesville and Olney. Leaders of each of the two towns selected a new electricity generator. In this case, everyone in Gatesville and Olney was given the option to stay with TNMP or choose to be served by a new provider. After considering offers from many suitors, both cities opted to enter into agreements with BTU. TNMP will continue to transmit and distribute power. The agreement provides for a guaranteed 8% to 10% savings for small customers.

Surprisingly, little research has been done by at Texas universities regarding the potential impact of electricity deregulation. One such study was a recent investigation by Phillip Johnson of the Texas Tech University Applied Economics Department. He examined how deregulation may affect agricultural users who use electric- and gas-powered pumps to irrigate crops. Results suggest that utility deregulation may have a significant adverse economic effect on farmers who use electricity to irrigate, as well as on the overall economy of the region.

In California, the Association of California Water Agencies was formed as an agent to purchase power for utilities. More than 380 utilities have banded together and, as a group, purchase roughly $710 million of electricity annually. Experts suggest that aggregation may reduce electricity costs by 5% to 20%.

In Rhode Island and Massachusetts, a 70-member aggregation unit which represents many of the largest electricity and natural gas users has been formed. Many water utilities which participate in this effort report at least a 5% savings in electricity costs, while those with higher loads anticipate greater reductions.

Texas Experiences

• The Texas–New Mexico Power Company has embarked on a pilot project for two of the small Texas towns it serves (Gatesville and Olney). Community leaders in each town considered a wide range of potential electricity providers and chose BTU, Inc. (formerly Bryan Texas Utilities). In this pilot project, consumers are guaranteed lower rates.

• A few public-owned power generators have already begun to sell assets, as required in SB7. This has occurred in Denton and near Bryan/ College Station.

• A recent Texas Tech University study suggests that deregulation may raise the cost of electricity for many farmers, as well as other users, in the High Plains.

Summary

Currently, many voices suggest that electricity deregulation will be very positive for Texas. They cite examples of other industries (airlines and telecommunications) where restructuring has increased services while reducing cost. According to proponents of electricity deregulation, the cost savings are out there, but water managers will have to aggressively seek them out.

It also must be noted that there may be adverse consequences of deregulation which must be considered. Although cost protections exist for individual and small consumers, at least in the short-term, there seems to be no guarantee that rates for large volume users, like water districts, may not go up. The issue of who will pay for stranded costs needs to be settled.

It needs to be emphasized that electricity deregulation may pose special challenges for water utilities and their customers. Many water mangers anticipate being able to obtain lower power costs, thereby saving money for their organizations and customers. Water resources entities which generate power must take a serious look at whether they want to compete in a deregulated environment and market power to others. They may also do well to contemplate what the potential adverse consequences may be of entering the marketplace and faring poorly, and what the resulting effects may be on the overall financial base of related governmental agencies. For example, how could a city's overall revenues be affected?

More attention needs to be paid to whether individual customers of water and wastewater utilities will see a reduction in the rates they pay, if their utilities are able to save money by obtaining electricity at a lower cost. The concerns of smaller, rural electric providers, need to be addressed to help ensure they can still compete in a restructured environment.

Finally, provisions of SB7 which require increased development of renewable energy sources should be applauded. Also, it needs to be clarified whether hydropower is classified as a "green" energy source.

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News from TWRI

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TWRI recently published a new technical report which describes the latest version of the Water Rights Availability Program (WRAP). The report includes a users manual as well as software. WRAP is being used throughout Texas to analyze water rights and water availability issues. The report, *Reference and Users Manual for the Water Rights Analysis Package* (TR-180), was written by Texas A&M University civil engineering research Ralph Wurbs . It can be purchased for $35. To order, contact TWRI at (409) 845-1851 or twri@tamu.edu.

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TWRI is now attempting to evaluate readers' opinions of our New Waves newsletter, which focuses on water research. We invite readers to take part in a brief evaluation at the TWRI WWW, http://twri.tamu.edu. Those who participate in the survey will be eligible to win a free copy of a new book about the Galveston flood of 1900, *Isaac's Storm*.

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