8.1 Description of Power System

8.1.1 Project Description and Owners

South Texas Project Unit 3 will be owned by ~~NRG~~ NINA South Texas 3 ~~LP~~ LLC and the City of San Antonio, Texas, acting by and through the City Public Service Board (CPS or CPS Energy). South Texas Project Unit 4 will be owned by ~~NRG~~ NINA South Texas 4 ~~LP~~ LLC and CPS Energy. Once licensed and built, STP 3 & 4 will be operated by STP Nuclear Operating Company. STP 3 & 4 each utilizes the GE Advanced Boiling Water Reactor (ABWR) light water reactor design rated at approximately 1370 MWe (gross). Initial commercial operation for STP 3 & 4 is expected to be June 2015 and July 2016, respectively.

~~NRG~~NINA South Texas 3 ~~LP~~ LLC and ~~NRG~~ NINA South Texas 4 ~~LP~~ LLC are ~~wholly-owned subsidiaries of~~ indirectly majority-owned and controlled by NRG Energy, Inc. (NRG Energy). In this discussion, "NRG" is used when referring to NRG Energy, the parent, or to one of the ~~NRG~~ NINA South Texas ~~LPs~~ LLCs. Further detail regarding the ownership of the NRG LLCs is provided in Part 1 of the COLA. NRG is a wholesale power generation company, primarily engaged in the ownership and operation of power generation facilities and the sale of energy, capacity and related products in the United States and internationally. NRG has a diverse portfolio of electric generation facilities in terms of geography, fuel type, and dispatch levels. NRG does not meet the definition of an electric utility in 10 CFR 50.2. NRG is a merchant generator that will sell its share of the electricity generated at STP 3 & 4 to the wholesale market in bilateral transactions with wholesale purchasers of electric power and at market prices. As such, NRG does not have a specific service area in the traditional sense of pre-deregulation utilities. The area of Texas that is served by the Electric Reliability Council of Texas (ERCOT) is the area in which NRG intends to sell its power.

As a municipal utility, CPS Energy meets the definition of an electric utility in 10 CFR 50.2, that provides retail power to its service area around San Antonio, which is within the ERCOT region, and sells excess capacity to wholesale buyers anywhere within the ERCOT system. The CPS Energy electric system serves a territory consisting of substantially all of Bexar County and small portions of the adjacent counties. Certification of this service area has been approved by the Public Utility Commission of Texas (PUCT). CPS Energy is currently the exclusive provider of electric service within this service area. Until and unless the San Antonio City Council and the CPS Energy Board exercise the option to opt-in to retail electric competition, CPS Energy has the sole right to provide retail electric services in its service area (Reference 8.1-1). The ERCOT studies being relied upon for the need for power evaluation include the CPS Energy electric system.

In addition to the area served at retail rates, CPS Energy currently has wholesale supply agreements to sell wholesale electricity to the Floresville Electric Light & Power System, the City of Hondo, and the City of Castroville. These three wholesale supply agreements have remaining terms ranging from less than one to ten years, although all of the agreements provide for extensions. Discussions are ongoing with all three entities to renew their respective long-term wholesale power agreements. Additionally,

CPS Energy has recently entered into several one-year wholesale supply agreements with various other municipalities and cooperatives. CPS Energy will seek additional opportunities to enter into long-term wholesale electric power agreements in the future. The requirements under the existing and any new wholesale agreements would be firm energy obligations of CPS Energy (Reference 8.1-1). In any event, because the need for power evaluation for STP 3 & 4 is based on the need for power in the entire ERCOT region, these supply agreements are not material to the need for power from STP 3 & 4 or the need for CPS Energy to develop additional generation to meet the needs of the growing customer base within its certificated service area.

8.1.2 Public Utility Commission and Electric Reliability Council of Texas

In 1975, Texas became the last state in the country to provide for state-wide comprehensive regulation of electric utilities by creating the Public Utility Commission of Texas (PUCT). For approximately the first 20 years of the PUCT's existence, its primary role was traditional regulation of electric and telecommunications utilities. Significant legislation enacted by the Texas Legislature in 1995 dramatically changed this role by creating a competitive electric wholesale market. In 1999, the Legislature provided for restructuring of the electric utility industry, further changing the PUCT's mission and focus (Reference 8.1-2).

Although the PUCT's traditional regulatory functions have decreased since 1999, many of those functions have been replaced by other, more challenging responsibilities. Restructuring of the utility industry is not simply elimination of regulation. Effective oversight of competitive wholesale and retail markets is necessary to ensure that customers receive the benefits of competition. The PUCT's responsibilities under the Public Utilities Regulatory Act (PURA) include the following (Reference 8.1-2):

- Issuance of certificates of convenience and necessity for proposed transmission lines
- Licensing of retail electric providers
- Registration of power generation companies and aggregators
- Oversight of competitive wholesale and retail markets
- Resolution of customer complaints, using informal processes whenever possible
- Implementation of a customer education program for retail electric choice
- Regulation of vertically integrated investor owned utilities outside ERCOT
- Jurisdiction over ratemaking and quality of service of transmission and distribution utilities within ERCOT
- Establishing wholesale transmission rates for investor owned utilities, cooperatives, and municipally-owned utilities within ERCOT

ERCOT is a membership-based 501(c)(6) nonprofit corporation governed by a board of directors and subject to oversight by the PUCT and the Texas Legislature. ERCOT's members include retail consumers, investor- and municipally-owned utilities, rural electric cooperatives, river authorities, independent generators, power marketers, and retail electric providers (Reference 8.1-3). The ERCOT board of directors is made up of independent members, consumers, and representatives from each of ERCOT's electric market segments. The board of directors appoints ERCOT's officers to direct and manage ERCOT's day-to-day operations, accompanied by a team of executives and managers responsible for critical components of ERCOT's operations areas (Reference 8.1-4).

ERCOT manages the flow of electric power to approximately 20 million Texas customers, representing 85% of the state's electric load and 75% of the state's land area (approximately 200,000 square miles). Figure 8.1-1 depicts the ERCOT region. As the independent system operator (ISO) for the region, ERCOT schedules power on an electric grid that connects 38,000 miles of high-voltage transmission lines and more than 500 generation units. ERCOT also manages financial settlements for the competitive wholesale bulk-power market and administers customer switching for 5.9 million Texans in competitive choice areas (Reference 8.1-3).

ERCOT performs three main roles in managing the electric power grid and marketplace (Reference 8.1-5):

- Monitor schedules submitted by wholesale buyers and sellers for the next day's electricity supply. ERCOT ensures the system can accommodate those schedules and, if necessary, creates a new market to fill the gap.
- Ensure electricity transmission reliability by managing the incoming and outgoing supply of electricity over the grid. ERCOT monitors the flow of power and issues instructions to generation and transmission companies to maintain balance.
- Serve as the central hub for retail transactions. When a consumer chooses a retail electric provider, ERCOT ensures the information related to that transaction is conveyed to the appropriate companies in a timely manner.

The ERCOT region is almost entirely isolated from other areas. At the beginning of World War II, several electric utilities in Texas banded together as the Texas Interconnected System (TIS) to support the war effort. They sent their excess power generation to industrial manufacturing companies on the Gulf Coast to provide reliable supplies of electricity for energy-intensive aluminum smelting. Recognizing the reliability advantages of remaining interconnected, the TIS members continued to use and develop the interconnected grid. TIS members adopted official operating guides for their interconnected power system and established two monitoring centers within the control centers of two utilities, one in North Texas and one in South Texas. TIS formed ERCOT in 1970 to comply with North American Reliability Council (NERC) requirements (Reference 8.1-6). The goal of TIS, and later ERCOT, was not to create ties with the rest of the country, but to assure that the Texas grid was reliable through interconnection. Even today, there are only a few asynchronous ties that go outside

of the ERCOT region with a total capacity of approximately 1100 MW. There are also approximately 2,850 MW of "switchable" generation resources that can be connected to either the ERCOT transmission grid or a grid outside the ERCOT region. There is currently no indication of plans to increase either the asynchronous MW or the switchable resources (Reference 8.1-7). While this means that ERCOT can only export a very small amount of power, it also means that ERCOT cannot import significant amounts of power. This becomes an important fact when considering the need for power in the ERCOT region. Essentially, all power required to supply the ERCOT region loads must be generated within the ERCOT region.

Representatives of all segments of ERCOT's market participants collaboratively created the ERCOT Protocols, which is the governing document adopted by ERCOT that contains the scheduling, operating, planning, reliability, and settlement policies, rules, guidelines, procedures, standards, and criteria of ERCOT. These Protocols were approved by the PUCT and amendments are subject to PUCT review and modification. The Protocols are intended to implement ERCOT's functions as the Independent Organization for the ERCOT Region as certified by the PUCT. The ERCOT Board, Technical Advisory Committee (TAC), and other ERCOT subcommittees authorized by the Board or the TAC, may develop procedures, forms and applications for the implementation of and operation under the Protocols. ERCOT and its market participants must abide by the Protocols (Reference 8.1-8).

Since deregulation of the electric supply market in the ERCOT region, utilities no longer perform the comprehensive analysis and planning functions they once did. The central planning organization under the new Texas market is the ERCOT ISO. State law assigns these obligations to ERCOT, under the oversight of the PUCT. The analyses, reports, system planning processes, and criteria development from ERCOT are the key measures for determining resource needs in the state [*See e. g.*, Tex. Util. Code Ann. §§ 39.155(b) and 39.904(k)].

8.1.3 Deregulation of the Texas Electric Utility Industry

The traditional discussion of the need for power, including a description of the power system, service areas, regional relationships, power pool agreements, electrical transfer capabilities, diversity interchange agreements, wheeling contracts, types of customers, and major electrical load centers, generally does not apply in the case of STP 3 & 4 because the electrical utility industry in Texas has been deregulated.

In 1995, the Texas Legislature passed Senate Bill 373 (SB 373) introducing wholesale competition into Texas' intrastate markets. Under what is now Chapter 35 of the PURA, prior bilateral transactions addressing use of the interconnected transmission systems of vertically integrated utilities within ERCOT were replaced by PUCT-regulated open access requirements and a methodology for placement of new merchant generation. SB 373 directed the PUCT to adopt rules requiring all transmission system owners to make their transmission systems available for use by others at prices and on terms comparable to each respective owner's use of its system for its own wholesale transactions. The PUCT implemented its initial transmission open access rules in January 1997.

During the 1999 legislative session, the Texas Legislature enacted Senate Bill 7 (SB 7), providing for retail electric open competition that began in 2002. SB 7 continued electric transmission wholesale open access and fundamentally redefined and

restructured the Texas electric industry. SB 7 allowed retail customers of investor-owned utilities (IOUs) to choose their electric energy supplier (Reference 8.1-1). SB 7 allowed municipally-owned utilities and electric cooperatives to remain non-opt-in entities (NOIEs) until they choose to enter competition. Most have elected to remain NOIEs. Therefore, the customers within the service areas of most electric cooperatives and municipally-owned utilities are not able to choose their electric energy supplier.

Under the terms of SB 7, NOIEs may remain vertically integrated electric utilities offering generation, transmission, and distribution services. However, SB 7 required IOUs to separate their retail energy service activities from regulated utility activities and to unbundle their generation, transmission/distribution, and retail electric sales functions into separate units. An IOU could choose to sell one or more of its lines of business to independent entities, or it could create separate but affiliated companies, and possibly operating divisions, that could be owned by a common holding company, but which must operate largely independent of each other subject to code of conduct restrictions under PUCT rules. The services offered by transmission entities had to be available to other parties on a non-discriminatory basis (Reference 8.1-1).

IOUs and independent power producers owning generation assets must be registered as Power Generation Companies (PGCs) with the PUCT and must comply with certain rules that are intended to protect consumers, but they are otherwise unregulated and may sell electricity in private bilateral transactions and at market prices (Reference 8.1-1).

IOU owners of transmission and/or distribution facilities, or Transmission Service Providers (TSPs), are fully regulated by the PUCT. IOU TSPs, Municipal Utilities, Electric Co-ops, and other entities providing transmission and distribution service are obligated to deliver the electricity to retail customers. These utilities are also required to transport power to wholesale buyers. TSPs are required to provide access to both their transmission and distribution systems on a non-discriminatory basis to all eligible customers (Reference 8.1-1).

Retail sales activities in the IOU service areas are performed by Retail Electric Providers (REPs) on a “customer choice” basis. These are the only entities authorized to sell electricity to retail customers. REPs must register with the PUCT, demonstrate financial capabilities, and comply with certain customer protection requirements. REPs buy electricity from PGCs, power marketers, or other parties and may resell that electricity to retail customers at any location in Texas other than within the service areas of Municipal Utilities and Electric Co-ops (Reference 8.1-1).

8.1.4 Market Economic Forces

Beyond compliance with operational procedures, ERCOT does not have authority over the business activities of its market participants. The economic forces of the market

and signed agreements by the market participants provide the cooperative atmosphere in which the ERCOT system functions.

Figures 8.1-2 and 8.1-3 demonstrate the market economic forces at work. Since 1999, ERCOT market participants have made the economic decision to decommission 95 units with a total generation capacity of 3,536 MW (Figure 8.1-2). These decisions were based on economic parameters such as unit efficiency, age, capacity, cost of operation, outage frequency, outage duration, and fuel cost. Similarly, since 1999, the ERCOT market participants have made the economic decision to add 205 new units and to upgrade 2 units for a total generation capacity of 25,372 MW (Figure 8.1-3). These decisions were based on the same economic parameters that led to decommissioning the 95 older units. Figures 8.1-2 and 8.1-3 show that on a county-by-county basis, in accordance with the market economic forces, the decommissioned units were sometimes replaced by new units and sometimes they were not replaced by new units.

By law, ERCOT must perform extensive annual and semi-annual studies, issue reports, make recommendations for transmission system needs and resource adequacy, and make legislative recommendations to further those objectives [See e. g., Tex. Util. Code Ann. §§ 39.155(b) and 39.904(k)]. ERCOT analyzes the region in the context of the competitive ERCOT market using load growth scenarios, industrial growth projections, regional transmission topology, sub-regional modeling, and new generation characteristics. The development of these reports is subject to vigorous market participant stakeholder input and review. ERCOT only forecasts the generation and transmission capacity that may be necessary to meet the forecast load. The market economic forces drive the market participants' decisions to increase or decrease their generation and transmission capacity.

8.1.5 References

8.1-1 Official Statement, City of San Antonio, Texas Electric and Gas Systems Revenue Funding Bonds, New Series 206B, dated January 10, 2007, available at http://www.cpsenergy.com/files/financial_data/Bonds_New_Series_2006B_OS.pdf, accessed on July 11, 2007

8.1-2 "Public Utility Commission of Texas Agency Strategic Plan For the Fiscal Years 2007-2011 Period," available at http://www.puc.state.tx.us/about/stratplan/stratplan.pdf, accessed on July 11, 2007.

8.1-3 "ERCOT Company Profile," available at http://www.ercot.com/about/profile/index.html, accessed on June 30, 2007.

8.1-4 "ERCOT Governance," available at http://www.ercot.com/about/governance/index.html, accessed on June 30, 2007.

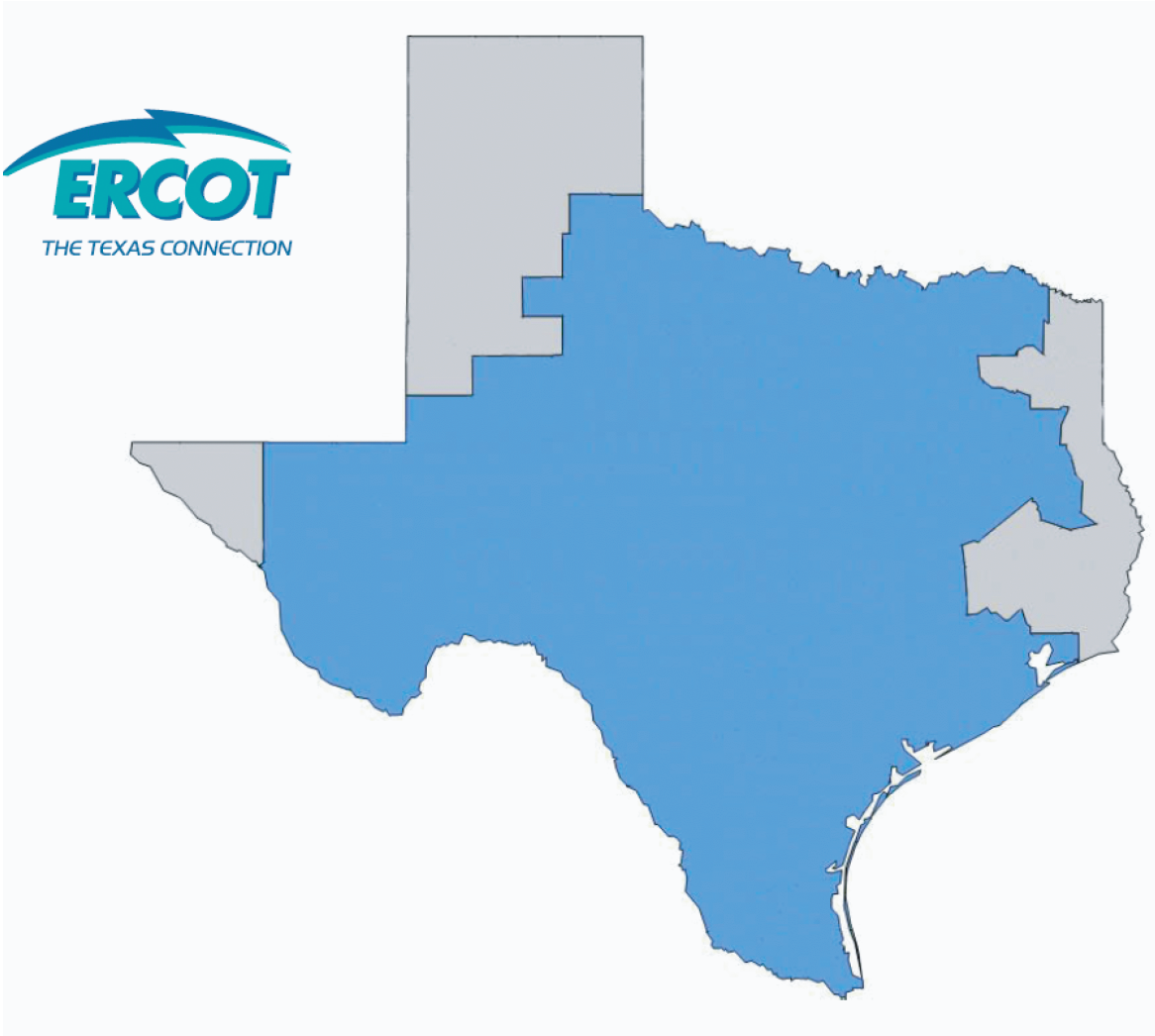
8.1-5 "ERCOT's Role," available at http://www.ercot.com/about/ercotrole.html, accessed on June 30, 2007.

8.1-6 "ERCOT History," available at http://www.ercot.com/about/profile/history/index.html, accessed on June 30, 2007.

8.1-7 Report on the Capacity, Demand, and Reserves in the ERCOT Region, May 2007, available at http://www.ercot.com/news/presentations/2007/07CDR05172007-final.xls.

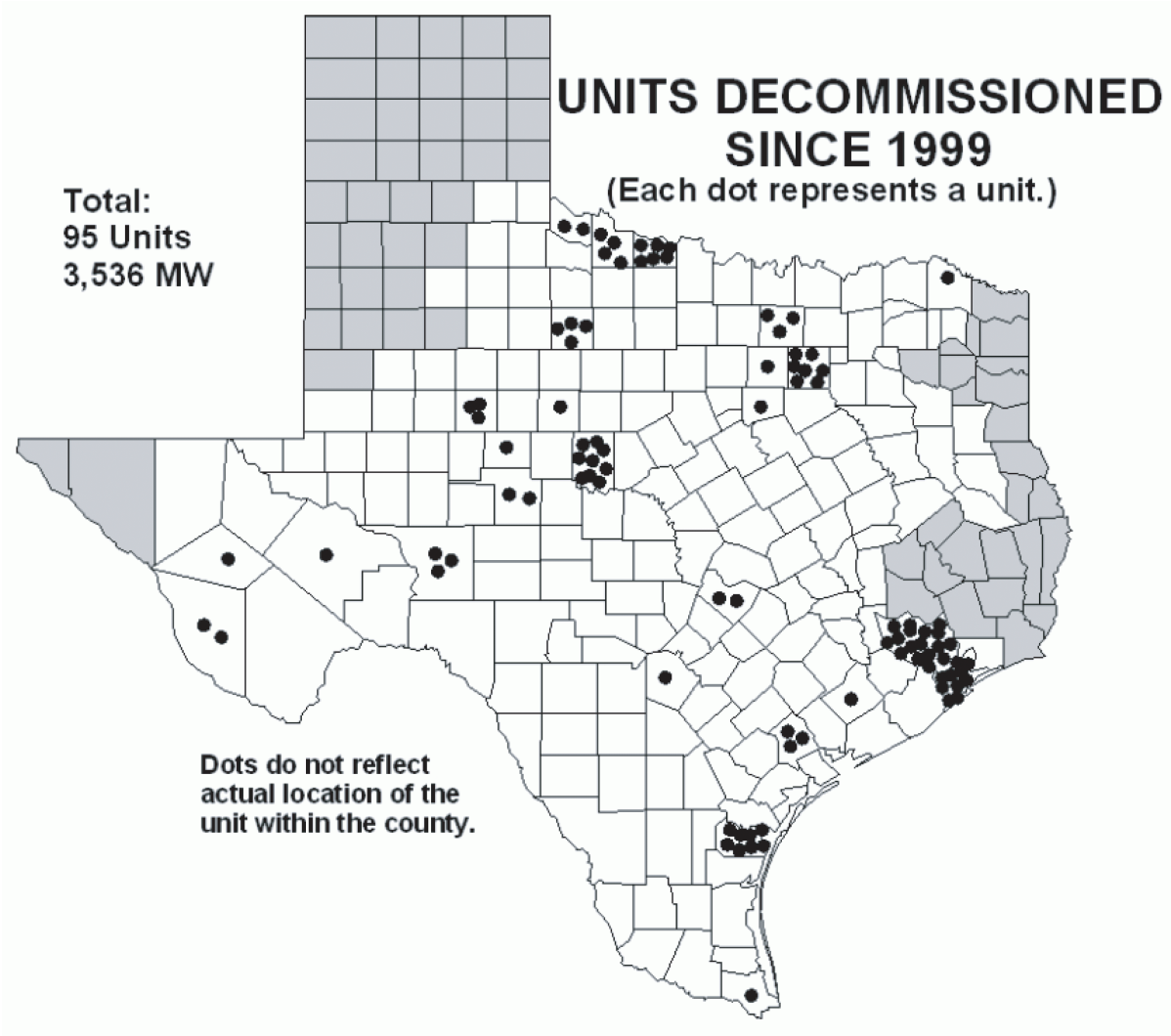
8.1-8 "ERCOT Protocols, Section 1: Overview," available at http://www.ercot.com/mktrules/protocols/current/01-050107.doc, accessed on July 10, 2007.

8.1-9 ERCOT Report on Existing and Potential Electric System Constraints and Needs, December 2006, available at http://www.ercot.com/news/presentations/2006/2006_ERCOT_Reports_Transmission_Constraints_and_Needs.pdf.



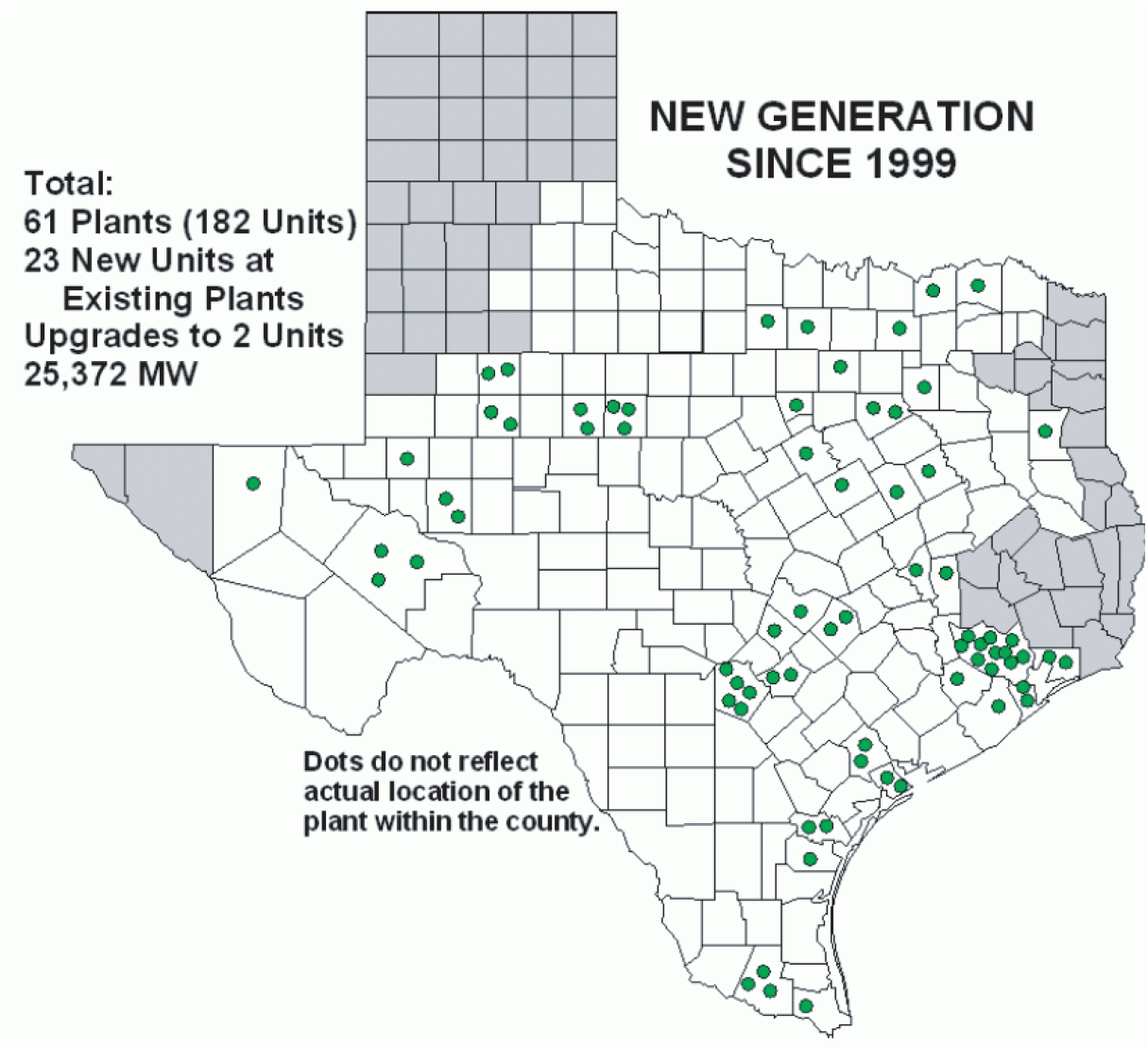
Reference 8.1-9

Figure 8.1-1 ERCOT Region



Reference 8.1-9

Figure 8.1-2 Units Decommissioned Since 1999



Reference 8.1-9

Figure 8.1-3 New ERCOT Generation Since 1999