

Texas

The first power plant in Texas began operation in Galveston in 1882, about the same time one was completed in Houston. The first plant in North Texas began operation in Dallas in 1883.¹ One hundred thirteen years later, Texas had the second largest population and the largest utility generating capability in the United States. The largest part of the utility electricity generated in Texas is from coal-fired plants, although the largest part of capability is gas-fired. Two of the five largest plants in Texas, including Houston Lighting and Power's W.A. Parish, the largest, are coal-fired. W. A. Parish is the third largest plant and the largest coal-fired plant in the Nation. Texas also relies on gas-fired plants, especially since Texas produces more natural gas than any other State. In terms of generating capability, the Texas Electric Utilities Company is the largest in the State and the third largest in the Nation. Nonutilities provide about 12 percent of capability and almost 17 percent of generation in the State.

The United States has three separate power grids connected by a few direct current tie lines: the Eastern Interconnected System, the Western Interconnected System, and the Texas Interconnected System. Utilities in each interconnection coordinate operations and planning and buy and sell power among themselves. Since utilities in the Texas Interconnected System are not connected with other utilities outside the State of Texas, and electric trade does not cross State boundaries for these utilities, the Federal Energy Regulatory Commission (FERC) does not have regulatory jurisdiction over them. In 1995, legislation was enacted to restructure the wholesale electricity industry in Texas consistent with FERC requirements for unbundled transmission service. The law also requires the establishment of an independent system operator (ISO). The ISO in the Electric Reliability Council of Texas (ERCOT)² differs somewhat from other ISOs like PJM and the one in California. The ERCOT ISO does not participate in generation dispatch, in power exchanges, in providing

ancillary services, or in establishing prices other than determining the cost of any redispatch needed to allow transactions to occur. In 1996, the Public Utility Commission (PUC) of Texas issued rules implementing the legislation that required transmission-owning utilities in the State to provide open access to the transmission system and ancillary services. The rule also required separation of transmission, distribution, and generation costs and rates, and the establishment of the ERCOT ISO.³

Texas did not have any generators that were named in the Clean Air Act Amendments of 1990 to begin compliance with stricter emissions reductions requirements for sulfur dioxide (SO₂) and nitrogen oxides (NO_x) in 1995. Emissions of SO₂ from Texas generators ranked eleventh in the Nation in 1996. Texas led the Nation in emissions of NO_x and carbon dioxide (CO₂) from generators of electric power. However, the concentrations of these pollutants per square mile ranked thirtieth, twenty-seventh and twenty-fifth, respectively. Emissions of SO₂ and NO_x from Texas generators increased from 1986 to 1991. The emissions totals of both pollutants then decreased from 1991 to 1996 but not back to the 1986 levels. CO₂ emissions increased over both time periods. The increase in the first time period was more substantial, however.

The average price of electricity, 6.16 cents per kilowatt-hour, was twenty-sixth most expensive in the Nation. Although the price in Texas was the national median price, it was more than half a cent per kilowatt-hour lower than the national average price. In 1996, 10 investor-owned utilities, 72 publicly owned utilities, and 79 cooperative utilities sold retail electricity in the State. The Texas Utilities Electric Company and Houston Power & Light, both investor-owned, are the largest utilities in the State in terms of retail sales. Investor-owned utilities in Texas sold almost 80 percent of retail electricity in the State in 1996.

¹Vance Gillmore, *And Work was Made Less, History of the Texas Electric Service Company*, Texas Electric Service Company (Fort Worth, TX, 1976) p.1.

²There are nine Regional Electric Reliability Councils in the United States. The Texas Interconnected System is also itself the Electric Reliability Council of Texas.

³Energy Information Administration, Status of State Electric Utility Deregulation Activity, http://www.eia.doe.gov/cneaf/electricity/chg_str/tab5rev.html.

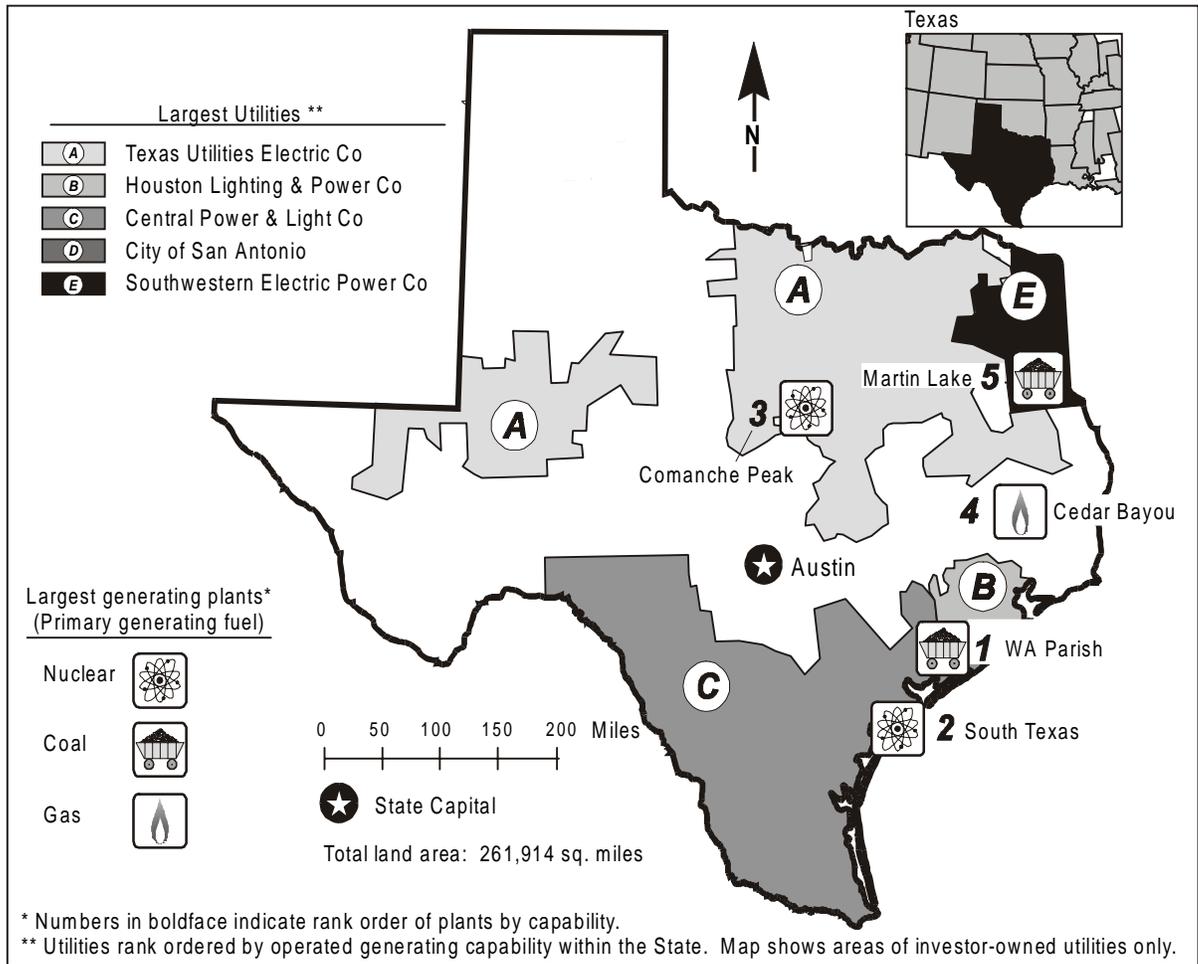


Table 1. 1996 Summary Statistics

Item	Value	U.S. Rank	Item	Value	U.S. Rank
NERC Region(s)	ERCOT/SPP/WCSS/SERC		Utility		
Net Exporter or Importer		Importer	Capability (MWe)	64,767	1
State Primary Generating Fuel		Coal	Generation (MWh)	272,282,585	1
Population (as of 7/96)	19,091,207	2	Average Age of Coal Plants	16 years	
Average Revenue (cents/kWh)	6.16	^a 26	Average Age of Oil-fired Plants	35 years	
Industry			Average Age of Gas-fired Plants	28 years	
Capability (MWe)	73,360	^b 1	Average Age of Nuclear Plants	6 years	
Generation (MWh)	327,369,838	^b 1	Average Age of Hydroelectric Plants	41 years	
Capability/person (KWe/person)	3.84	^b 11	Average Age of Other Plants	9 years	
Generation/person (MWh/person)	17.15	^b 11	Nonutility^c		
Sulfur Dioxide Emissions (Thousand Short Tons)	498	11	Capability (MWe)	8,593	2
Nitrogen Oxide Emissions (Thousand Short Tons)	741	1	Percentage Share of Capability	11.7	14
Carbon Dioxide Emissions (Thousand Short Tons)	260,519	1	Generation (MWh)	55,087,253	2
Sulfur Dioxide/sq. mile (Tons)	1.90	30	Percentage Share of Generation	16.8	11
Nitrogen Oxides/sq. mile (Tons)	2.83	27			
Carbon Dioxide/sq. mile (Tons)	994.67	25			

Table 2. Five Largest Plants, 1996

Plant	Type	Operating Utility	Net Capacity (MWe)
1. W A Parish	Coal/Gas	Houston Lighting & Power Co	3,614
2. South Texas	Nuclear	Houston Lighting & Power Co	2,502
3. Comanche Peak	Nuclear	Texas Utilities Electric Co	2,430
4. Cedar Bayou	Gas	Houston Lighting & Power Co	2,250
5. Martin Lake	Coal	Texas Utilities Electric Co	2,250

Table 3. Top Five Utilities with Largest Generating Capacities, and Type, Within the State, 1996
(Megawatts Electric)

Utility	Net Summer Capacity	Net Coal Capacity	Net Oil Capacity	Net Gas Capacity	Net Nuclear Capacity	Net Hydro/Other Capacity
A. Texas Utilities Electric Co	21,355	5,825	20	13,080	2,430	--
B. Houston Lighting & Power Co ...	15,653	3,855	--	9,296	2,502	--
C. Central Power & Light Co	3,793	632	--	3,155	--	6
D. City of San Antonio	3,725	1,340	--	2,385	--	--
E. Southwestern Electric Power Co	3,637	2,234	--	1,403	--	--
Total	48,163	13,886	20	29,319	4,932	6
Percentage of Industry Capacity	65.7	--	--	--	--	--

-- = Not applicable.

Figure 1. Utility Generating Capacity by Primary Energy Source, 1996

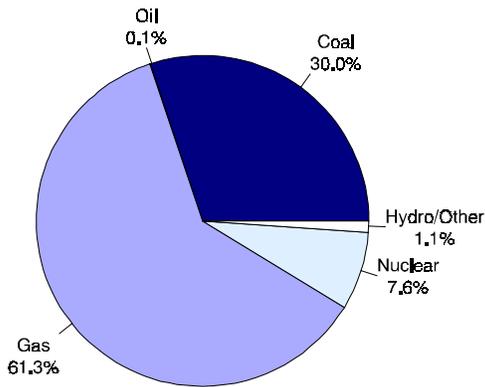


Figure 2. Utility Generation by Primary Energy Source, 1996

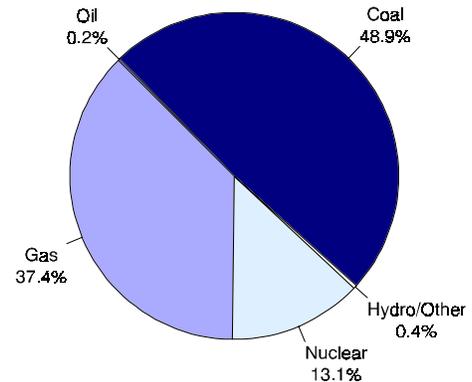


Figure 3. Energy Consumed at Electric Utilities by Primary Energy Source, 1996

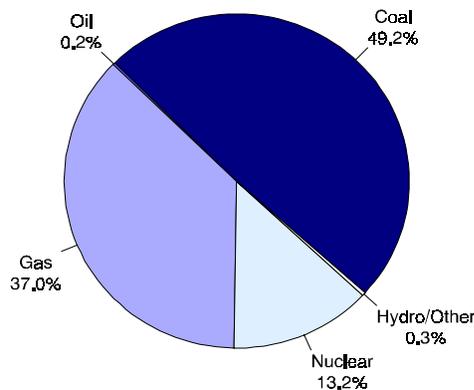


Table 4. Electric Power Industry Generating Capability by Primary Energy Source, 1986, 1991, and 1996
(Megawatts Electric)

Fuel	1986	1991	1996	Percentage Share 1986	Percentage Share 1991	Percentage Share 1996
Coal	18,059	18,776	19,399	29.1	27.1	26.4
Oil	603	58	48	1.0	0.1	0.1
Gas	37,346	39,052	39,705	60.3	56.4	54.1
Nuclear	--	3,650	4,932	--	5.3	6.7
Hydro/Other	659	644	683	1.1	0.9	0.9
Total Utility	56,667	62,180	64,767	91.4	89.8	88.3
Total Nonutility	5,300	7,069	8,593	8.6	10.2	11.7
Industry	61,967	69,249	73,360	100.0	100.0	100.0

-- = Not applicable.

Table 5. Electric Power Industry Generation of Electricity by Primary Energy Source, 1986, 1991, and 1996
(Thousand Kilowatthours)

Fuel	1986	1991	1996	Percentage Share 1986	Percentage Share 1991	Percentage Share 1996
Coal	100,855,392	118,085,107	133,255,364	40.5	41.3	40.7
Oil	410,162	218,714	558,659	0.2	0.1	0.2
Gas	109,305,066	97,738,623	101,748,031	43.9	34.2	31.1
Nuclear	--	19,799,867	35,766,550	--	6.9	10.9
Hydro/Other	2,279,837	2,501,057	953,981	0.9	0.9	0.3
Total Utility	212,850,456	238,343,368	272,282,585	85.5	83.3	83.2
Total Nonutility	36,074,085	47,696,383	55,087,253	14.5	16.7	16.8
Industry	248,924,541	286,039,751	327,369,838	100.0	100.0	100.0

-- = Not applicable.

Table 6. Electric Power Industry Consumption by Primary Energy Source, 1986, 1991, and 1996
(Quadrillion Btu)

Fuel	1986	1991	1996	Percentage Share 1986	Percentage Share 1991	Percentage Share 1996
Coal	1.082	1.270	1.412	37.2	38.6	38.2
Oil	0.005	0.003	0.006	0.2	0.1	0.2
Gas	1.146	1.035	1.064	39.4	31.5	28.8
Nuclear	--	0.213	0.380	--	6.5	10.3
Hydro/Other	0.024	0.026	0.010	0.8	0.8	0.3
Total Utility	2.257	2.547	2.872	77.6	77.5	77.6
Total Nonutility	0.650	0.741	0.828	22.4	22.5	22.4
Industry	2.907	3.287	3.700	100.0	100.0	100.0

-- = Not applicable.

Figure 4. Utility Generation of Electricity by Primary Energy Source, 1986-1996

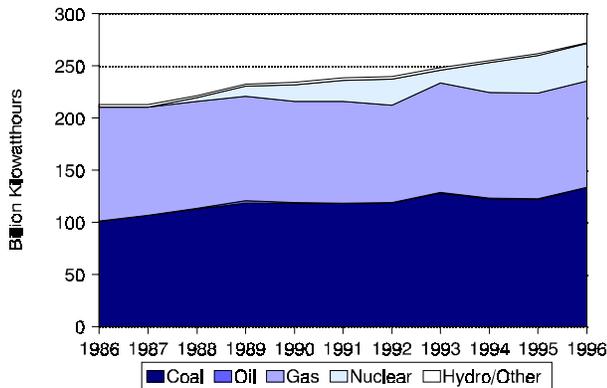


Figure 5. Utility Delivered Fuel Prices for Coal, Oil, and Gas, 1986-1996
(1996 Dollars)

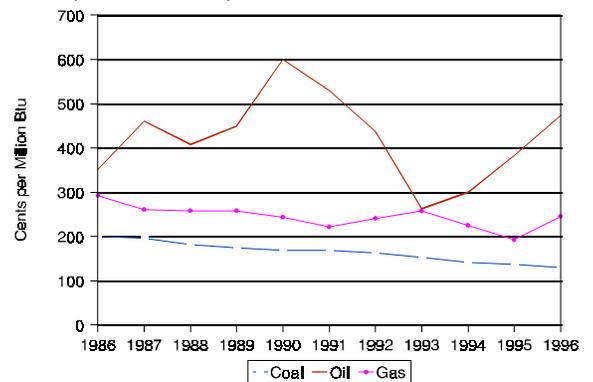


Table 7. Utility Delivered Fuel Prices for Coal, Oil, and Gas, 1986, 1991, and 1996
(Cents per Million Btu, 1996 Dollars)

Fuel	1986	1991	1996	Annual Growth Rate 1986-1996 (Percent)
Coal	200.0	168.5	129.5	-4.3
Oil	351.8	529.3	473.2	3.0
Gas	293.0	221.9	245.6	-1.8

Table 8. Electric Power Industry Emissions Estimates, 1986, 1991, and 1996
(Thousand Short Tons)

Emission Type	1986	1991	1996	Annual Growth Rate 1986-1996 (Percent)
Sulfur Dioxide	405	569	498	2.1
Nitrogen Oxides ^d	528	746	741	3.5
Carbon Dioxide ^d	178,312	241,978	260,519	3.9

Figure 6. Estimated Sulfur Dioxide Emissions, 1986-1996

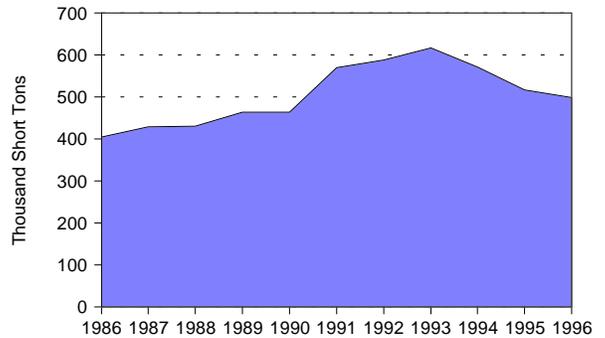


Figure 7. Estimated Nitrogen Oxide Emissions, 1986-1996

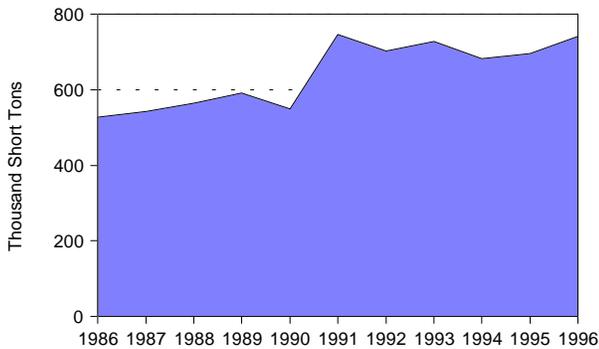


Figure 8. Estimated Carbon Dioxide Emissions, 1986-1996

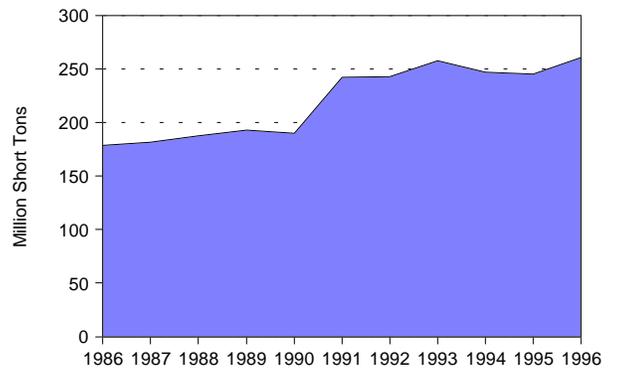


Table 9. Utility Retail Sales by Sector, 1986, 1991, and 1996
(Megawatthours)

Sector	1986	1991	1996	Annual Growth Rate 1986-1996 (Percent)	Percentage Share 1986	Percentage Share 1991	Percentage Share 1996
Residential	72,392,320	84,088,111	99,656,148	3.2	33.9	35.0	35.8
Commercial	55,268,865	61,447,400	70,865,539	2.5	25.9	25.6	25.5
Industrial	79,527,235	84,122,423	95,308,450	1.8	37.3	35.0	34.2
Other	6,081,122	10,693,853	12,619,446	7.6	2.9	4.4	4.5
Total	213,269,549	240,351,787	278,449,583	2.7	100.0	100.0	100.0

Figure 9. Nuclear Power Capacity Factor Comparison, 1986-1996

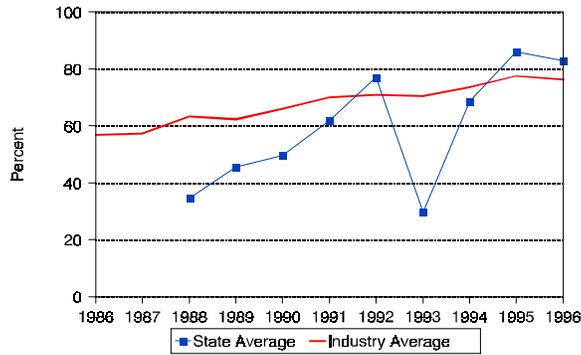


Table 10. Utility Retail Sales Statistics, 1986, 1991, and 1996

Item	Investor-Owned Utility	Public	Federal	Cooperative	Total
	1986				
Number of Utilities	11	72	--	79	162
Number of Retail Customers	5,099,332	1,110,329	--	1,006,498	7,216,159
Retail Sales (MWh)	174,306,480	24,267,249	--	14,695,820	213,269,549
Percentage of Retail Sales	81.7	11.4	--	6.9	100.0
Revenue from Retail Sales (thousand 1996 \$) ^e	12,093,541	2,006,925	--	1,326,677	15,427,143
Percentage of Revenue	78.4	13.0	--	8.6	100.0
	1991				
Number of Utilities	10	73	--	79	162
Number of Retail Customers	5,380,460	1,143,727	--	1,074,170	7,598,357
Retail Sales (MWh)	194,343,526	28,040,029	--	17,968,232	240,351,787
Percentage of Retail Sales	80.9	11.7	--	7.5	100.0
Revenue from Retail Sales (thousand 1996 \$) ^e	13,068,332	1,903,722	--	1,387,143	16,359,197
Percentage of Revenue	79.9	11.6	--	8.5	100.0
	1996				
Number of Utilities	10	75	--	77	162
Number of Retail Customers	5,858,772	1,295,531	--	1,238,265	8,392,568
Retail Sales (MWh)	221,020,782	34,390,868	--	23,037,933	278,449,583
Percentage of Retail Sales	79.4	12.4	--	8.3	100.0
Revenue from Retail Sales (thousand 1996 \$) ^e	13,408,246	2,127,850	--	1,614,608	17,150,704
Percentage of Revenue	78.2	12.4	--	9.4	100.0

-- = Not applicable.