

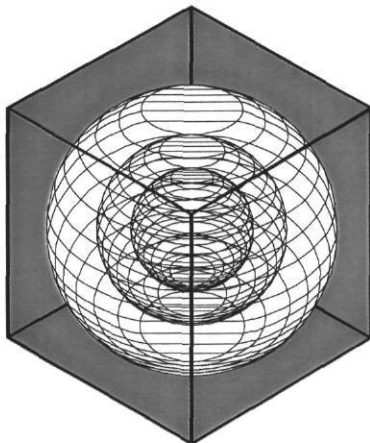
**PROCEDURE TO CALCULATE NO<sub>x</sub>  
REDUCTIONS USING THE EMISSIONS &  
GENERATION RESOURCE INTEGRATED  
DATABASE (E-GRID) SPREADSHEET**

**Report to the  
Texas Commission for Environmental Quality  
For Texas' Senate Bill 5 Legislation For Reducing  
Pollution in Non-attainment and Affected Areas**

Jeff Haberl, Piljae Im, Charles Culp, Bahman Yazdani  
Tom Fitzpatrick, Malcolm Verdict, Dan Turner

Energy Systems Laboratory  
Texas A&M University System

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**ENERGY SYSTEMS  
LABORATORY**

Texas Engineering Experiment Station  
Texas A&M University System

## 1. Introduction

In this report a detailed description of the procedure to calculate NOx reductions from energy savings due to the 2000 IECC code implementation in single family residences using the United States Environmental Protection Agency's (USEPA's) Emissions and Generation Resource Integrated Database (E-GRID) is presented. This procedure is proposed for calculating county-wide NOx reductions in pounds per MWh for Energy Efficiency and Renewable Energy projects (EE/RE) implemented in each Power Control Area (PCA) in the ERCOT region

E-GRID is a comprehensive database of environmental attributes of electric power systems. E-GRID is based on available plant-specific data for all U.S. electricity generating plants that provide power and report data to the U.S. government. Data reported for each power generator includes generation (in MWh), resource mix (for renewables and non-renewables), emissions (in tons for NOx, SO2, and CO2; and in pounds of mercury), emission rates (in both pounds per megawatt-hour [lbs/MWh] and pounds per million Btu [lbs/MMBtu] for NOx, SO2, and CO2; and in both pounds per gigawatt-hour [lbs/GWh] and pounds per billion Btu [lbs/BBtu] for mercury), heat input (in MMBtu), and capacity (in MW). E-GRID also reports changes in ownership and industry structure as well as power flows between states and grid regions. For more information on E-GRID, see <http://www.epa.gov/cleanenergy/egrid.htm>.

Table 1 shows the E-GRID table published in November 2002.<sup>1</sup> This table is the result of a methodology Art Diem of USEPA performed using E-GRID data. This methodology distributes reductions in energy generation within the ERCOT territory using E-GRID power flow data and E-GRID plant level capacity factor data. The EGRID plant level NOx emission factors are applied to these generation changes and aggregated to the county level.

## 2. Description of the Tables

For the ESL's Senate Bill 5 project, several tables are needed to convert the county-wide electricity savings from 2000 IECC code implementation into NOx reductions at the power plants that provided the electricity using the EPA's EGRID database. In this section, an explanation of the procedure and a detailed description of the tables (i.e., spreadsheets) used to perform the calculations are presented.

**Table 1.** Table 1 shows county-wide NOx reductions per MWh of energy savings by each Power Control Area (PCA). The column headings indicate each PCA in the ERCOT region. The first column shows Federal Implementation Plan (FIP) code for each county, and the second column gives each corresponding county in the ERCOT region having

<sup>1</sup> The Energy Systems Laboratory (ESL) received this table from Mr. Art Diem ((Environment and Energy Integration) Phone: 202-564-3525 ([diem.art@epa.gov](mailto:diem.art@epa.gov))) at the USEPA in November 2002.

electric generators that could be affected by the energy savings. The next ten columns give the NOx reductions by each PCA for one megawatt of energy savings.

In Table 1, fifty counties have electric generating plants that would be affected by energy savings based on the methodology in the ERCOT region. Each cell shows the average amount of NOx (in pounds) that could be reduced by electric generators in that county if one megaWatt-hour of electricity (i.e., savings) is realized within the PCA for that column. Counties that do not have NOx values do not contain electric power generating plants that would be affected by energy savings realized within the PCAs shown in the column. The Total values shown at the bottom of each column represent the total NOx reduced by one megaWatt-hour of energy savings.

**Table 2.** Table 2 presents an expanded version of Table 1. The shaded counties do not have an electricity-generating plant that would be affected by energy savings according to this EPA methodology, or are not in the ERCOT region analyzed by EGRID. Seventy-one (71) county names are shown in Table 2. Of the thirty-eight (38) non-attainment or affected counties, there are five (5) counties that do not have electricity-generating plants owned by PCAs. Eleven (11) counties are not in the ERCOT region, and may contain power plants from other generators. Finally, not all municipal power generating plants appear to be in the EGRID database.

**Table 3.** In the Table 3, Table 2 was modified to allow for the calculation of NOx reductions when electricity production (i.e., savings) is entered in the bottom row for each PCA. To accomplish this, an empty column was added next to the each PCA column. NOx emissions reductions for each county in the specific PCA are calculated in this column according to the total MWh entered into the bottom of the PCA column. One additional column was added to the right side of the spreadsheet that calculates total NOx reductions (Tons/yr) for each county. This value represents the NOx produced by all PCAs in one particular county, as reported by EGRID. The modified parts of the table are shaded.

**Table 4.** Table 4 shows all electric utility providers for each county in Texas. This table was obtained from the Public Utility Commission of Texas (PUCT) website (<http://www.puc.state.tx.us>, November 2002). This table provides each county's region name and the electric utility providers for each county. For the calculations performed by the ESL in this report, *the first electric utility shown in each row was assumed to be the only electric utility for that county*, since the % electricity distribution are not published by the PUCT, and could not be obtained for purposes of publishing this report.

**Table 5 and 6.** Table 5 is the summary table from the ESL's 2002 TNRCC report<sup>2</sup>. In this table, each county was assigned to a corresponding PCA using the PCA map

<sup>2</sup> Haberl, J., Culp, C., Yazdani, B., Fitzpatrick, T., and Turner, D. 2002. "Texas Senate Bill 5 Legislation for Reducing Pollution in Non-attainment and Affected Areas: Annual Report", submitted to the Texas Natural Resources Conservation Commission, Energy Systems Laboratory Report ESL-TR-02/07-01, Texas A&M University, 116 pages, (Revised: September).

published by ERCOT in May of 2002<sup>3</sup>. The assigned PCA is important because the September 2002 NOx emissions rate was decided according to the PCA shown, using the June 2002 NOx emissions rates published by the TNRCC. The third column shows the assigned PCA for each county using the ERCOT map. The fourth column gives the TMY2 weather locations that was used to perform the simulation. The fifth column lists the 2000 IECC climate zone that corresponds to the county. This climate zone was used to select the code compliant design characteristics. The sixth column shows the National Association of Home Builder's (NAHB) designation regarding which division of survey data pertained to the county shown. The seventh column shows the number of projected housing units according to the Real Estate Center at Texas A&M. This projection was determined using linear regression of the last several years of available data for each county. The eighth column gives the average floor area for a single family house according to the NAHB survey data for 1999. The ninth column gives the simulated energy use for the house calculated with the code-traceable DOE-2 simulation using the TMY2 weather location for each county. The tenth column shows the energy use of a similar house<sup>4</sup> built to code-complaint specifications. Columns eleven and twelve show the peak day electricity use for the average 1999 house and the code-compliant house for each county. Column thirteen shows the annual electricity savings for each house and column fourteen shows the total savings for all houses built in each county and includes a 20% transmission and distribution loss. Column fifteen shows the NOx emissions rates for the utility provider that was assumed to provide the electricity to each county<sup>5</sup>. Column 16 provides the annual tons of NOx emissions savings from implementation of the 2000 IECC to the new single family housing units listed for each county and includes the 20% T&D losses. Column 17 provides the average tons-NOx/day for each county, which represents the annual total (tons-NOx/year) divided by 365. Column 18 provides the tons-NOx/day calculated by multiplying the peak electricity savings for each county times the NOx emissions rates for the utility provider<sup>6</sup>. The bottom row in Table 5 gives the total values for all non-attainment and affected counties.

In Table 6, the electric utility providers were updated to reflect the data in Table 4. The shaded columns in Table 6 show the updated NOx values that including the new values from Table 4. Table 6 also provides peak day savings that include the 20% T&D losses. It is worth noting that the combination of the 20% T&D loss and the new NOx values increased the total peak-day emissions rates from 2.09 to 2.6 tons-NOx/peak-day.

### 3. Sample Calculation

In this section two example calculations are presented. The first one is for the calculation of annual NOx emissions reductions and the other is for the calculation of peak day NOx emission reductions. In this calculation procedure, all calculations were performed using

<sup>3</sup> The map obtained from the ERCOT was presented by Mr. Ken Donoho at the Hot and Humid conference in Houston, Texas in May. This map is contained on page 71 of the ESL's September 2002 report to the TNRCC (ESL-TR-02/07-01). County assignments were made by choosing the predominate utility provider from the map.

<sup>4</sup> Characteristics such as floor area, window-to-wall ratio, etc., are held constant, wall R-value, roof R-value, window U-value, window SHGC, air-conditioner SEER and furnace AFUE were changed.

<sup>5</sup> These values represent the June 2002 values published by the TNRCC from the EPA's EGRID report.

<sup>6</sup> This value does not include a 20% T&D factor.



several EXCEL spreadsheets. To perform these calculations, the user inputs the electricity savings for each PCA into the appropriate cells in the bottom row of the spreadsheet (Table 3).

### Calculation of annual NOx emissions reductions

As shown in Table 1, the energy savings from a PCA cause NOx emission reductions in other counties where the power plant is located. Since the ESL's summary table (See Table 6) presents the energy savings for each county, as a first step, the energy savings for each county were totaled by PCA. Table 7 presents the total electricity savings by PCA. Since the EPA's EGRID table only provides values for the ERCOT Region only, the counties included in the other NERC regions such as SERC, WSCC and SPP are excluded in this calculation. From the Table 7, 27 counties are in ERCOT region, and the other 11 counties are in SERC, WSCC and SPP regions. According to the Table 7, the total electricity savings estimated in SERC, WSCC and SPP regions are 23,683 MWh per year which is about 12.5% of total electricity savings in 38 counties. In addition, the total NOx reductions in SERC, WSCC and SPP regions are 31.7 tons per year which is about 7.5% of total NOx reductions for 38 counties. Therefore, future analysis using EGRID will need to be expanded to include the total NOx reductions from electricity savings in all 38 counties.

As the next step of the calculation, energy savings (MWh) for each PCA in the Table 7 were entered into the last row of the corresponding column for the appropriate PCA in Table 3. For example, there was 2,477.2 MWh energy savings in the American Electric Power West/PCA (Table 7). This was input in the last row of the American Electric Power West/PCA column in Table 9.

Then, the NOx emissions reductions due to the energy savings by county were calculated as shown in the corresponding cells. For example, for Bastrop County, 2,477.2 MWh of electricity savings is multiplied by 0.01 which is shown beside in the row for Bastrop county (See Table 9). The calculated value, 24.77 lbs of NOx is from the 2,477.2 MWh saved by AEP due to the implementation of the 2000 IECC to single family residential.

After repeating this calculation for all counties and all PCAs, the NOx emissions reductions for each county are calculated by summing all value for the county across the row. For example, for Bastrop County, 8,862.27 lbs of NOx ( $= 24.77 + 4,977.32 + 3,572.11 + 288.07$ ) are reduced from all electricity savings for AEP, Austin Energy, Lower Colorado River Authority, and San Antonio Public Service Bd. PCAs (See Table 10)

### Calculation of peak day NOx emission reductions

This calculation procedure is nearly the same as the previous calculation. Table 8 was developed to calculate peak-day NOx emission reductions. This calculation is important since peak-day NOx emissions reductions are about 2x greater than average daily NOx emissions reductions calculated by dividing the annual NOx emissions by 365.

As a first step of the calculation, peak day energy savings (MWh) for each PCA in the Table 8 were entered into the last row of the corresponding column in Table 3.

Then, the NOx emissions reductions due to the energy savings by county were calculated as shown in the corresponding cells.

After repeating this calculation for all counties and all PCAs, the NOx emissions reduction for each county is calculated by summing all value for the county across the row. Table 11 shows the finished calculation results.

## 4. Results

In this section, the calculated electricity savings and NOx emissions reductions are presented in figures and maps to better facilitate an understanding of the where the different counties are located and the magnitude of the emissions reductions from implementation of the 2000 IECC.

**Figure 1.** Figure 1 shows the distribution of the 38 non-attainment and affected counties in Texas. Non-attainment counties are shown in blue and affected counties are shown in light blue.

**Figure 2 and 3.** Figure 2 shows the geographical distribution of projected 2002 annual electricity savings due to the implementation of the 2000 IECC to new single-family houses in the non-attainment and affected counties. Figure 3 presents the savings for each county sorted from the biggest savers to the smallest savers. These savings correspond to the values listed in Table 6. The savings were calculated using the code-traceable DOE-2 simulation, which compared the 1999 NAHB average house against the code-compliant house for each county. In this figure, “other counties” means the counties that are not included in the non-attainment and affected counties but shown in the EGRID table (Table 1).

**Figure 4 and 5.** Figure 4 shows the geographical distribution of annual NOx emissions reductions from power plants due to the 2000 IECC. Figure 5 shows the individual county NOx reductions. These NOx emissions reductions were calculated using the procedure outlined in Table 10. It is interesting to note in Figures 4 and 5 that much of the NOx emissions reductions occur in counties where there is limited growth in residential single-family housing. Conversely, it is clear that much of the pollution produced by housing is produced in counties other than the counties where the electricity is consumed.

**Figure 6 and 7.** Figure 6 and 7 shows the distribution of 2002 peak day electricity savings due to the implementation of the 2000 IECC to new single-family houses. These values were calculated using the actual peak electricity savings as shown in Table 11.

**Figure 8 and 9.** Figure 8 and 9 shows the distribution of peak day NOx emissions reductions from power plants due to the 2000 IECC. These NOx emissions reductions were calculated in the previous procedure in Table 11. It is interesting to note in Figure 9 that three counties (i.e., Ward, McLennan, and Mitchell) rise significantly in NOx reductions during peak days when compared to annual NOx reductions (Figure 5).

County-wide NOx Reductions in pounds per MWh for EE/RE implemented in each listed PCA											
Cnty_FIP	County	American Electric Power - West (ERCOT)/PCA	Austin Energy/PCA	Brownsville Public Utils Board/PCA	Lower Colorado River Authority/PCA	Reliant Energy HL&P/PCA	San Antonio Public Service Bd/PCA	South Texas Electric Coop Inc/PCA	Texas Municipal Power Pool/PCA	Texas-New Mexico Power Co/PCA	TXU Electric/PCA
48021	BASTROP	0.01	0.20		0.34		0.01				
48029	BEXAR	0.06	0.09	0.04	0.16		2.00	0.08	0.01		
48039	BRAZORIA	0.01	0.01			0.05	0.01				
48041	BRAZOS		0.01		0.01			0.03	0.11		0.01
48057	CALHOUN	0.19		0.14	0.01			0.04	0.01		0.01
48061	CAMERON	0.14		0.20				0.03			0.01
48071	CHAMBERS	0.05	0.06	0.03	0.02	0.35	0.08	0.03	0.02	0.02	0.03
48073	CHEROKEE	0.01	0.01	0.01	0.02			0.02	0.06	0.02	0.10
48081	COKE	0.03		0.02				0.01			
48083	COLEMAN	0.02		0.01							
48085	COLLIN	0.01	0.01		0.02	0.01		0.05	0.19		0.02
48105	CROCKETT	0.14		0.11				0.03			0.01
48113	DALLAS	0.06	0.06	0.04	0.09	0.03	0.01	0.09	0.30	0.09	0.51
48121	DENTON		0.01		0.01			0.04	0.15		0.01
48147	FANNIN	0.02	0.02	0.01	0.03	0.01		0.03	0.09	0.03	0.17
48149	FAYETTE	0.02	0.86	0.02	1.51	0.01	0.04	0.01	0.02	0.02	0.02
48157	FORT BEND	0.13	0.17	0.10	0.06	1.01	0.23	0.09	0.06	0.07	0.10
48161	FREESTONE	0.02	0.02	0.02	0.04	0.01		0.03	0.12	0.04	0.22
48163	FRIO	0.05		0.04	0.01			1.15	0.07		
48167	GALVESTON	0.05	0.06	0.04	0.02	0.39	0.09	0.04	0.03	0.42	0.04
48185	GRIMES	0.01	0.01		0.02	0.01		0.06	0.23		0.01
48197	HARDEMAN	0.01		0.01							
48201	HARRIS	0.05	0.07	0.04	0.02	0.41	0.09	0.04	0.02	0.03	0.04
48207	HASKELL	0.16		0.12	0.01			0.03	0.01		0.01
48213	HENDERSON				0.01				0.02	0.01	0.03
48215	HIDALGO	0.13		0.10				0.03			
48221	HOOD	0.02	0.02	0.02	0.04	0.01		0.03	0.12	0.04	0.22
48251	JOHNSON								0.01		
48253	JONES	0.14		0.11				0.03			0.01
48277	LAMAR										0.01
48293	LIMESTONE	0.01	0.01			0.05	0.01				
48299	LLANO		0.12		0.21		0.01				
48309	MCLENNAN	0.04	0.04	0.03	0.07	0.02	0.01	0.06	0.22	0.07	0.40
48335	MITCHELL	0.04	0.04	0.03	0.07	0.02	0.01	0.06	0.21	0.07	0.39
48353	NOLAN										0.01
48355	NUECES	0.74	0.01	0.55	0.02	0.01	0.01	0.15	0.02	0.01	0.03
48363	PALO PINTO	0.01	0.02	0.01	0.03	0.01		0.09	0.36		0.02
48367	PARKER							0.01	0.03		
48387	RED RIVER								0.01		0.02
48395	ROBERTSON					0.01				0.40	0.01
48401	RUSK	0.01	0.01	0.01	0.01			0.01	0.04	0.01	0.07
48439	TARRANT	0.04	0.04	0.03	0.06	0.02	0.01	0.05	0.18	0.06	0.33
48441	TAYLOR	0.01									
48449	TITUS	0.01	0.01	0.01	0.02			0.02	0.05	0.02	0.10
48453	TRAVIS		0.46		0.05						
48459	VICTORIA	0.30	0.01	0.22	0.01			0.68	0.05		0.01
48475	WARD	0.06	0.06	0.04	0.09	0.02	0.01	0.08	0.28	0.10	0.51
48479	WEBB	0.06		0.05				0.01			
48481	WHARTON					0.01					
48503	YOUNG	0.02	0.02	0.01	0.03	0.01		0.03	0.09	0.03	0.16
	<b>TOTAL</b>	<b>2.90</b>	<b>2.56</b>	<b>2.24</b>	<b>3.16</b>	<b>2.50</b>	<b>2.65</b>	<b>3.28</b>	<b>3.22</b>	<b>1.59</b>	<b>3.66</b>

**Table 1.** EPA's EGRID table: County-wide NOx Reductions in pounds per MWh for EE/RE Implemented in each listed PCA (Received from USEPA at November 2003)

Area	County	American Electric Power - West (ERCOT)/PCA	Austin Energy/PCA	Brownsville Public Utils Board/PCA	Lower Colorado River Authority/PCA	Reliant Energy HL&P/PCA	San Antonio Public Service Bd/PCA	South Texas Electric Coop INC/PCA	Texas Municipal Power Pool/PCA	Texas-New Mexico Power Co/PCA	TXU Electric/PCA
Austin-San Antonio Area	BASTROP	0.01	0.20		0.34		0.01				
	BEXAR	0.06	0.09	0.04	0.16		2.00	0.08	0.01		
	TRAVIS		0.46		0.05						
	FAYETTE	0.02	0.86	0.02	1.51	0.01	0.04	0.01	0.02		0.02
	LLANO		0.12		0.21		0.01				
	CALDWELL										
	COMAL										
	GUADALUPE										
Dallas-Fort Worth Area	HAYS										
	WILLIAMSON										
	WILSON										
	COLLIN	0.01	0.01		0.02	0.01		0.05	0.19		0.02
	DALLAS	0.06	0.06	0.04	0.09	0.03	0.01	0.09	0.30	0.09	0.51
	DENTON		0.01		0.01			0.04	0.15		0.01
	JOHNSON								0.01		
	PARKER							0.01	0.03		
	CHEROKEE	0.01	0.01	0.01	0.02			0.02	0.06	0.02	0.10
	COKE	0.03		0.02				0.01			
	COLEMAN	0.02		0.01							
	FANNIN	0.02	0.02	0.01	0.03	0.01		0.03	0.09	0.03	0.17
	FRIO	0.05		0.04	0.01			1.15	0.07		
	HARDEMAN	0.01		0.01							
	HASKELL	0.16		0.12	0.01			0.03	0.01		0.01
	HENDERSON				0.01				0.02	0.01	0.03
	HOOD	0.02	0.02	0.02	0.04	0.01		0.03	0.12	0.04	0.22
	JONES	0.14		0.11				0.03			0.01
	LAMAR										0.01
	LIMESTONE	0.01	0.01			0.05	0.01				
	MCLENNAN	0.04	0.04	0.03	0.07	0.02	0.01	0.06	0.22	0.07	0.40
	MITCHELL	0.04	0.04	0.03	0.07	0.02	0.01	0.06	0.21	0.07	0.39
	NOLAN										0.01
	PALO PINTO	0.01	0.02	0.01	0.03	0.01		0.09	0.36		0.02
RED RIVER								0.01		0.02	
TAYLOR	0.01										
TITUS	0.01	0.01	0.01	0.02			0.02	0.05	0.02	0.10	
YOUNG	0.02	0.02	0.01	0.03	0.01		0.03	0.09	0.03	0.16	
TARRANT	0.04	0.04	0.03	0.06	0.02	0.01	0.05	0.18	0.06	0.33	
ELLIS											
KAUFMAN											
ROCKWALL											
Houston - Galveston Area	BRAZORIA	0.01	0.01			0.05	0.01				
	BRAZOS		0.01		0.01			0.03	0.11		0.01
	GRIMES	0.01	0.01		0.02	0.01		0.06	0.23		0.01
	WHARTON					0.01					
	CHAMBERS	0.05	0.06	0.03	0.02	0.35	0.08	0.03	0.02	0.02	0.03
	FORT BEND	0.13	0.17	0.10	0.06	1.01	0.23	0.09	0.06	0.07	0.10
	GALVESTON	0.05	0.06	0.04	0.02	0.39	0.09	0.04	0.03	0.42	0.04
	ROBERTSON					0.01				0.40	0.01
	HARRIS	0.05	0.07	0.04	0.02	0.41	0.09	0.04	0.02	0.03	0.04
	HARDIN										
	JEFFERSON										
	LIBERTY										
El Paso Area	MONTGOMERY										
	ORANGE										
	WALLER										
	EL PASO										
	RUSK	0.01	0.01	0.01	0.01			0.01	0.04	0.01	0.07
	CROCKETT	0.14		0.11				0.03			0.01
	FREESTONE	0.02	0.02	0.02	0.04	0.01		0.03	0.12	0.04	0.22
	CALHOUN	0.19		0.14	0.01			0.04	0.01		0.01
	HIDALGO	0.13		0.10				0.03			
	CAMERON	0.14		0.20				0.03			0.01
	WARD	0.06	0.06	0.04	0.09	0.02	0.01	0.08	0.28	0.10	0.51
	WEBB	0.06		0.05				0.01			
	NUECES	0.74	0.01	0.55	0.02	0.01	0.01	0.15	0.02	0.01	0.03
	VICTORIA	0.30	0.01	0.22	0.01			0.68	0.05		0.01
	GREGG										
	HARRISON										
	SMITH										
UPSHUR											
SAN PATRICIO											
TOTAL		2.89	2.54	2.22	3.12	2.48	2.63	3.27	3.19	1.54	3.65

**Table 2.** EPA’s EGRID table: County-wide NOx Reductions in pounds per MWh for EE/RE Implemented in each listed PCA (Including 38 Non-attainment and Affected Counties)

Area	County	American Electric Power		Austin Energy/PCA	Brownsville Public Utility Board/PCA	Lower Colorado River Authority/PCA	Reliant Energy H&L/PCA	San Antonio Public Service B&P/PCA	South Texas Electric Coop INC/PCA	Texas Municipal Power Pool/PCA	Texas-New Mexico Power Co/PCA	TDU Electric/PCA	Total NOx Reductions (MMBtu)	
		West (ERCOT) PCA	NOx Reductions (MMBtu)											
Austin-San Antonio Area	BASTROP	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	BEKAR	0.06	0.00	0.00	0.04	0.00	0.16	0.00	0.00	2.00	0.00	0.08	0.00	0.00
	TRAVIS	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	FAYETTE	0.02	0.00	0.00	0.00	0.00	1.51	0.00	0.00	0.04	0.00	0.01	0.00	0.00
	LLANO	0.00	0.12	0.00	0.00	0.00	0.21	0.00	0.00	0.01	0.00	0.00	0.00	
	CALDWELL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	COMAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	GUADALUPE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	HAYS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	WILLAMSON	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Dallas-Fort Worth Area	COLLIN	0.01	0.00	0.01	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.05	0.00	0.00
	DALLAS	0.06	0.00	0.06	0.00	0.04	0.00	0.09	0.00	0.00	0.00	0.00	0.00	
	DENTON	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.15	0.00	
	JOHNSON	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	
	RAVENS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	CHEROKEE	0.01	0.00	0.01	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.06	0.00	
	COKE	0.02	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	
	COLEMAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	FANNIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	FRO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Houston-Galveston Area	HAZEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	HASKELL	0.16	0.00	0.00	0.12	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
	HENDERSON	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
	HOOD	0.02	0.00	0.02	0.00	0.00	0.04	0.00	0.01	0.00	0.00	0.03	0.00	
	JONES	0.14	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	LAMAR	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	LIMESTONE	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	MCKENNA	0.04	0.00	0.04	0.00	0.03	0.00	0.07	0.00	0.02	0.00	0.00	0.00	
	MITCHELL	0.04	0.00	0.04	0.00	0.03	0.00	0.07	0.00	0.02	0.00	0.00	0.00	
	ROUSE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
El Paso Area	PALO PINTO	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	
	RED RIVER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	TAYLOR	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	TITUS	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	YOUNG	0.02	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	TARRANT	0.04	0.00	0.04	0.00	0.03	0.00	0.06	0.00	0.00	0.00	0.00	0.00	
	ELLIS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	KAUFMAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	ROCKWALL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	ETC	SRAOKIA	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SRAPOS		0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
GURMES		0.01	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	
WHARTON		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CHAMBERS		0.06	0.00	0.06	0.00	0.03	0.00	0.02	0.00	0.00	0.00	0.00	0.00	
FORT BEND		0.13	0.00	0.13	0.00	0.06	0.00	1.01	0.00	0.23	0.00	0.00	0.00	
GALVESTON		0.05	0.00	0.05	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ROBERTSON		0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	
HARRIS		0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	
HARROLD		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
JEFFERSON	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
LIBERTY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
MONROE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
ORANGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
WALLER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
EL PASO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
ETC	RUSK	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
	CRICKETT	0.14	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	FREESTONE	0.02	0.00	0.02	0.00	0.00	0.04	0.00	0.01	0.00	0.00	0.00	0.00	
	CALHOUN	0.19	0.00	0.00	0.14	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
	DELALDO	0.13	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	CAMERON	0.14	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	WARD	0.08	0.00	0.06	0.04	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.00	
	WEBB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	BAZES	0.24	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	
	VICTORIA	0.30	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
GREGG	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
HARRISON	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
SMITH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
UPSHUR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
SAN PATRICK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
TOTAL	2.88	0.00	2.54	0.00	2.22	0.00	3.12	0.00	2.48	0.00	2.63	0.00	3.27	
Energy Savings by PCA from ESI (MMBtu)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Table 3. Modified Calculation





County	Region Number	Region Name	Electric Utilities
JACKSON	17	Golden Crescent Regional Planning Commission	CP(AEP) Jackson EC Victoria EC DaWitt EC
JASPER	14	Deep East Texas Council of Governments	ENTERGY Jasper-Newton EC Deep East Texas EC Sam Houston EC
JEFF DAVIS	8	Rio Grande Council of Governments	WT(UAEP) Rio Grande EC
JIM HOGG	15	South East Texas Regional Planning Commission	ENTERGY Medina EC
JIM WELLS	20	Coastal Bend Council of Governments	CP(AEP) Nueces EC San Patricio EC
JOHNSON	4	North Central Texas Council of Governments	ONCOR T-NMP United Coop Services
JONES	7	West Central Texas Council of Governments	WT(UAEP) Taylor EC Big Country EC
KARNES	18	Alamo Area Council of Governments	CP(AEP) Floresville EC
KAUFMAN	4	North Central Texas Council of Governments	ONCOR Trinity Valley EC
KENDALL	18	Alamo Area Council of Governments	BOEME Central Texas EC Pedernales EC
KENEDY	20	Coastal Bend Council of Governments	WT(UAEP) Magic Valley EC
KERR	18	Alamo Area Council of Governments	WT(UAEP) South Plains EC Big Country EC
KIMBLE	10	Concho Valley Council of Governments	WT(UAEP) Kerrville EC Bandera EC Central Texas EC
KOBE	2	South Plains Association of Governments	WT(UAEP) Concho Valley Council of Governments
KOENIG	24	Middle Rio Grande Development Council	CP(AEP) Rio Grande EC Medina EC
KLEBERG	20	Coastal Bend Council of Governments	CP(AEP) Nueces EC
KNOX	7	West Central Texas Council of Governments	WT(UAEP) Tri-County EC
LA SALLE	24	Middle Rio Grande Development Council	CP(AEP) Medina EC
LAMAR	5	AA-Tex Council of Governments	ONCOR T-NMP Lamar County EC
LAMB	2	South Plains Association of Governments	XCEL(SPS) Llano County EC
LAMPASAS	23	Central Texas Council of Governments	ONCOR Llano County EC
LAVACA	17	Golden Crescent Regional Planning Commission	CP(AEP) Schulenburg EC Yoakum EC
LEE	12	Capitol Area Planning Council	GIDDINGS Lexington EC Fayette EC
LEON	13	Brazos Valley Council of Governments	ONCOR ENTERGY
LIBERTY	16	Houston-Galveston Area Council	ENTERGY Sam Houston EC
LIMESTONE	11	Heart of Texas Council of Governments	ONCOR ENTERGY Navasota Valley EC
LIPSICOMB	1	Panhandle Regional Planning Commission	T-NMP North Plains EC
LIVE OAK	20	Coastal Bend Council of Governments	CP(AEP) San Patricio EC
LLANO	12	Capitol Area Planning Council	ONCOR Llano County EC
LOVING	9	Permian Basin Regional Planning Commission	ONCOR XCEL(SPS) Lubbock EC
LUBBOCK	2	South Plains Association of Governments	XCEL(SPS) ONCOR South Plains EC
LYNN	13	Brazos Valley Council of Governments	ENTERGY Houston County EC
MADISON	6	East Texas Council of Governments	SWEP(CO/AEP) Upland-Rural EC
MARION	9	Permian Basin Regional Planning Commission	ONCOR Rock EC
MARTIN	6	East Texas Council of Governments	SWEP(CO/AEP) Mason EC
MASON	9	Concho Valley Council of Governments	CP(AEP) Cap Rock EC
MATAGORDA	16	Houston-Galveston Area Council	CP(AEP) RELIANT(CENTER POINT) Jackson EC
MAVERICK	24	Middle Rio Grande Development Council	WT(UAEP) Rio Grande EC
MCCLULLOCH	10	Concho Valley Council of Governments	CP(AEP) Brady EC
MCLENNAN	11	Heart of Texas Council of Governments	ONCOR T-NMP McLennan County EC
MCMULLEN	20	Coastal Bend Council of Governments	CP(AEP) Kames EC
MEDIA	16	Alamo Area Council of Governments	CP(SB) Medina EC
MENARD	10	Concho Valley Council of Governments	WT(UAEP) Cap Rock EC
MILAND	9	Permian Basin Regional Planning Commission	ONCOR Cap Rock EC
MILAM	23	Central Texas Council of Governments	ONCOR ENTERGY Bellville EC
MILLS	23	Central Texas Council of Governments	ONCOR Cap Rock EC Hamilton County EC
MITCHELL	7	West Central Texas Council of Governments	ONCOR Cap Rock EC
MONTAGUE	3	North Texas Regional Planning Commission	ONCOR T-NMP
MONTGOMERY	16	Houston-Galveston Area Council	ENTERGY RELIANT(CENTER POINT) Bowie EC
MOORE	1	Panhandle Regional Planning Commission	XCEL(SPS) RELIANT(CENTER POINT) Mid-South EC
MORRIS	5	AA-Tex Council of Governments	SWEP(CO/AEP) Bowie-Cass EC Upland-Rural EC
MOTLEY	14	Deep East Texas Council of Governments	WT(UAEP) Lighthouse EC
NACOGDOCHES	4	Deep East Texas Council of Governments	ONCOR Cherokee County EC
NAVARRO	4	North Central Texas Council of Governments	ONCOR Navarro County EC
NEWTON	14	Deep East Texas Council of Governments	ONCOR Jasper-Newton EC
NOLAN	7	West Central Texas Council of Governments	WT(UAEP) ONCOR Taylor EC
NUECES	20	Coastal Bend Council of Governments	CP(AEP) Robstown EC Nueces EC
OCHILTREE	1	Panhandle Regional Planning Commission	T-NMP North Plains EC
OLDHAM	16	Brazos Valley Council of Governments	XCEL(SPS) XCEL(SPS) Deal Smith EC
ORANGE	15	South East Texas Regional Planning Commission	ENTERGY Jasper-Newton EC
PALO PINTO	4	North Central Texas Council of Governments	ONCOR T-NMP
PANOLA	6	East Texas Council of Governments	SWEP(CO/AEP) Rusk County EC
PARKER	4	North Central Texas Council of Governments	WT(UAEP) Waxahatchee EC
PARKER	4	Panhandle Regional Planning Commission	XCEL(SPS) Deal Smith EC
PECOS	9	Permian Basin Regional Planning Commission	WT(UAEP) ONCOR
PEKOH	14	Deep East Texas Council of Governments	ENTERGY Lenoir EC
POTTER	1	Panhandle Regional Planning Commission	XCEL(SPS) RFA Blanca EC
PRESIDIO	8	Rio Grande Council of Governments	WT(UAEP) Rio Grande EC
RANS	6	East Texas Council of Governments	T-NMP FEC Electric
RANDALL	15	Panhandle Regional Planning Commission	XCEL(SPS) Greenbelt EC
REAGAN	10	Concho Valley Council of Governments	WT(UAEP) Cap Rock EC
REAL	24	Middle Rio Grande Development Council	CP(AEP) Bandera EC
RED RIVER	5	AA-Tex Council of Governments	SWEP(CO/AEP) Bandera EC
REEVES	9	Permian Basin Regional Planning Commission	WT(UAEP) ONCOR
REFUGIO	20	Coastal Bend Council of Governments	CP(AEP) San Patricio EC
ROBERTS	1	Panhandle Regional Planning Commission	XCEL(SPS) Greenbelt EC
ROBERTSON	13	Brazos Valley Council of Governments	ENTERGY Hearne EC
ROCKWALL	4	North Central Texas Council of Governments	ONCOR FEC Electric
RUNNELS	7	West Central Texas Council of Governments	WT(UAEP) Coleman County EC
RUSK	14	Deep East Texas Council of Governments	SWEP(CO/AEP) ONCOR
SABINE	6	Deep East Texas Council of Governments	Hempshire EC Jasper-Newton EC
SAN AUGUSTINE	14	Deep East Texas Council of Governments	San Augustine EC
SAN JACINTO	14	Deep East Texas Council of Governments	ENTERGY San Houston EC
SAN PATRICK	20	Coastal Bend Council of Governments	CP(AEP) San Patricio EC
SAN SABA	23	Central Texas Council of Governments	ONCOR Central Texas EC
SCHLEICHER	10	Concho Valley Council of Governments	WT(UAEP) Pedernales EC
SCURRY	7	West Central Texas Council of Governments	ONCOR Cap Rock EC
SHACKELFORD	7	West Central Texas Council of Governments	WT(UAEP) Fort Belknap EC
SHELBY	14	Deep East Texas Council of Governments	SWEP(CO/AEP) Deep East Texas EC
SHERMAN	1	Panhandle Regional Planning Commission	XCEL(SPS) RFA Blanca EC
SMITH	1	East Texas Council of Governments	SWEP(CO/AEP) ONCOR
SOMERVELL	4	North Central Texas Council of Governments	T-NMP United Coop Services
STARR	19	South Texas Development Council	CP(AEP) Medina EC
STEPHENS	7	West Central Texas Council of Governments	WT(UAEP) Comanche EC
STERLING	10	Concho Valley Council of Governments	WT(UAEP) Cap Rock EC
STONEWALL	7	West Central Texas Council of Governments	WT(UAEP) Big Country EC
SUTTON	10	Concho Valley Council of Governments	WT(UAEP) Pedernales EC
SWISHER	1	Panhandle Regional Planning Commission	XCEL(SPS) Tala EC
TARRANT	4	North Central Texas Council of Governments	ONCOR Tri-County EC
TAYLOR	7	West Central Texas Council of Governments	WT(UAEP) Taylor EC
TERRELL	9	Permian Basin Regional Planning Commission	T-NMP Rio Grande EC
TERRY	2	South Plains Association of Governments	XCEL(SPS) Brownfield EC
THROCKMORTON	7	West Central Texas Council of Governments	WT(UAEP) Fort Belknap EC
TITUS	5	AA-Tex Council of Governments	SWEP(CO/AEP) T-NMP
TOM GREEN	10	Concho Valley Council of Governments	WT(UAEP) Concho Valley EC
TRAVIS	12	Capitol Area Planning Council	ONCOR Austin Energy EC
TRINITY	14	Deep East Texas Council of Governments	ENTERGY Houston County EC
TYLER	14	Deep East Texas Council of Governments	ENTERGY San Houston EC
UPSHUR	6	East Texas Council of Governments	SWEP(CO/AEP) Upland-Rural EC
UPTON	9	Permian Basin Regional Planning Commission	WT(UAEP) ONCOR
UVALDE	24	Middle Rio Grande Development Council	CP(AEP) Bandera EC
VAL VERDE	24	Middle Rio Grande Development Council	CP(AEP) Rio Grande EC
VAN ZANDT	6	East Texas Council of Governments	SWEP(CO/AEP) Wood County EC
VICTORIA	17	Golden Crescent Regional Planning Commission	CP(AEP) Victoria EC
WALKER	16	Houston-Galveston Area Council	ENTERGY Mid-South EC
WALLER	16	Houston-Galveston Area Council	RELIANT(CENTER POINT) Hempstead EC
WARD	9	Permian Basin Regional Planning Commission	ONCOR T-NMP
WASHINGTON	13	Brazos Valley Council of Governments	ENTERGY Fayette EC
WEBB	19	South Texas Development Council	CP(AEP) Rio Grande EC
WHARTON	16	Houston-Galveston Area Council	RELIANT(CENTER POINT) CPL(AEP) Wharton County EC
WHEELER	1	Panhandle Regional Planning Commission	XCEL(SPS) WT(UAEP) Greenbelt EC
WICHITA	3	North Texas Regional Planning Commission	ONCOR ONCOR
WILBARGER	3	North Texas Regional Planning Commission	WT(UAEP) Vernon EC
WILLACAMON	21	Lower Rio Grande Valley Development Council	ONCOR Magic Valley EC
WILLAMSON	12	Capitol Area Planning Council	ONCOR Austin Energy EC
WILSON	18	Alamo Area Council of Governments	CP(AEP) Guadalupe Valley EC
WINFRED	9	Permian Basin Regional Planning Commission	ONCOR T-NMP
WISE	4	North Central Texas Council of Governments	ONCOR Brijegott EC
WOOD	4	East Texas Council of Governments	SWEP(CO/AEP) ONCOR
YOAKUM	2	South Plains Association of Governments	XCEL(SPS) Lytregar EC
YOUNG	3	North Texas Regional Planning Commission	ONCOR T-NMP
ZAPATA	19	South Texas Development Council	CP(AEP) Medina EC
ZAVALA	24	Middle Rio Grande Development Council	CP(AEP) Rio Grande EC

Table 4(b). PUCT Power Suppliers by County (Obtained from PUCT website, <http://www.puc.state.tx.us>, November, 2002)

	County	Power Control Area <sup>1</sup>	TMY2 <sup>2</sup>	Climate Zone <sup>3</sup>	Division (East or West) <sup>4</sup>	No. of projected units <sup>5</sup>	Floor Area (ft <sup>2</sup> ) <sup>6</sup>	1999 Average Energy Use (KWh) <sup>7</sup>	IECC 2001 Energy Use (KWh) <sup>8</sup>	1999 Peak Day(KWh /House) <sup>3</sup>	IECC Peak Day(KWh /House) <sup>10</sup>	Savings per house (KWh) <sup>11</sup>	Total Savings (MWh) 1999-IECC w/ 20% T&D Loss <sup>12</sup>	lb. NOx/MWh <sup>13</sup>	Total Savings		
															Tons/Year <sup>14</sup>	Tons/Day <sup>15</sup>	Peak Tons/Day <sup>16</sup>
Affected County	Bastrop	ERCOT	Austin	4 West	146	2,426	16,545	13,310	77.98	59.56	3,235	566.77	2.69	0.7623	0.0021	0.0036	
	Bastrop	San Antonio Public Service Bd	San Antonio	4 West	7,168	2,426	16,681	13,332	71.48	55.66	3,349	28,806.76	3.24	46.6669	0.1279	0.1837	
	Caldwell	ERCOT	Austin	4 West	101	2,426	16,545	13,310	77.98	59.56	3,235	392.08	2.69	0.5274	0.0014	0.0025	
	Comal	ERCOT	San Antonio	4 West	1,111	2,426	16,681	13,332	71.48	55.66	3,349	4,464.89	2.69	6.0053	0.0165	0.0236	
	Ellis	TXU	Fort Worth	5 West	649	2,426	15,465	12,448	82.47	61.45	3,017	2,349.64	3.34	3.9239	0.0108	0.0228	
	Gregg	SWEPCO	Lufkin	6 East	194	2,548	13,139	11,258	65.34	52.74	1,881	437.90	2.68	0.5870	0.0016	0.0033	
	Guadalupe	ERCOT	San Antonio	4 West	476	2,426	16,681	13,332	71.48	55.66	3,349	1,920.99	2.69	2.5837	0.0071	0.0102	
	Harrison	SWEPCO	Lufkin	6 East	33	2,548	13,139	11,258	65.34	52.74	1,881	74.49	2.68	0.0999	0.0003	0.0006	
	Hays	ERCOT	Austin	5 West	737	2,426	16,662	13,160	76.83	58.28	3,502	3,097.17	2.69	4.1657	0.0114	0.0184	
	Johnson	TXU	Fort Worth	5 West	629	2,426	15,465	12,448	82.47	61.45	3,017	2,277.23	3.34	3.9030	0.0104	0.0221	
	Kaufman	TXU	Fort Worth	6 West	218	2,426	15,725	12,419	78.10	58.40	3,306	864.85	3.34	1.4443	0.0040	0.0072	
	Nueces	CRI	Corpus Christi	3 East	841	2,548	14,364	12,651	63.46	56.11	1,703	1,718.67	2.68	2.3039	0.0063	0.0083	
	Parker	TXU	Fort Worth	6 West	302	2,426	15,725	12,419	78.10	58.40	3,306	1,198.09	3.34	2.0008	0.0065	0.0099	
	Rockwall	TXU	Fort Worth	6 West	1,111	2,426	15,725	12,419	78.10	58.40	3,306	4,407.56	3.34	7.3606	0.0202	0.0366	
	Rusk	SWEPCO	Lufkin	5 East	17	2,548	13,139	11,253	65.34	52.97	1,886	38.47	2.68	0.0516	0.0001	0.0003	
	San Patricio	CRI	Corpus Christi	3 East	218	2,548	14,364	12,651	63.46	56.11	1,703	445.50	2.68	0.5972	0.0016	0.0021	
	Smith	TXU	Lufkin	5 East	465	2,548	13,139	11,253	65.34	52.97	1,886	1,052.39	3.34	1.7575	0.0048	0.0096	
	Travis	Austin Energy	Austin	5 West	5,922	2,426	16,662	13,160	76.83	58.28	3,502	24,886.61	1.44	17.9184	0.0491	0.0791	
	Upshur	SWEPCO	Lufkin	6 East	17	2,548	13,139	11,258	65.34	52.74	1,881	38.37	2.68	0.0514	0.0001	0.0003	
	Victoria	CRI	Victoria	3 East	156	2,548	13,923	12,251	67.25	60.21	1,672	313.00	2.68	0.4196	0.0011	0.0015	
Williamson	TXU	Austin	5 West	4,111	2,426	16,662	13,160	76.83	58.28	3,502	17,276.07	2.68	23.1586	0.0634	0.1022		
Wilson	ERCOT	San Antonio	4 West	16	2,426	16,681	13,332	71.48	55.66	3,349	64.30	2.69	0.0865	0.0002	0.0003		
Nonattainment County	Brazoria	Reliant Energy HL & P	Houston	3 East	2,008	2,548	13,740	11,859	66.52	55.568	1,881	4,532.46	1.88	4.2605	0.0117	0.0207	
	Chambers	EGS	Port Arthur	4 East	318	2,548	12,913	11,297	59.02	49.96	1,616	616.67	2.68	0.8266	0.0023	0.0039	
	Collin	TXU	Fort Worth	5 West	9,639	2,426	15,725	12,419	78.10	58.40	3,306	38,239.84	3.34	63.8605	0.1750	0.3172	
	Dallas	TXU	Fort Worth	5 West	8,595	2,426	15,465	12,448	82.47	61.45	3,017	31,117.34	3.34	51.9660	0.1424	0.3017	
	Denton	TXU	Fort Worth	6 West	5,338	2,426	15,725	12,419	78.10	58.40	3,306	21,176.91	3.34	35.3654	0.0969	0.1757	
	El Paso	EL PASO Electric Company	El Paso	6 West	3,098	2,426	16,065	12,684	76.74	56.52	3,401	12,643.56	2.68	16.9487	0.0464	0.0839	
	Fort Bend	Reliant Energy HL & P	Houston	4 East	1,049	2,548	13,093	11,467	61.75	51.80	1,626	2,046.81	1.88	1.9240	0.0053	0.0098	
	Galveston	Reliant Energy HL & P	Houston	3 East	2,338	2,548	13,740	11,859	66.52	55.568	1,881	5,277.33	1.88	4.9607	0.0136	0.0241	
	Hardin	EGS	Port Arthur	4 East	19	2,548	12,913	11,297	59.02	49.96	1,616	36.84	2.68	0.0494	0.0001	0.0002	
	Harris	Reliant Energy HL & P	Houston	4 East	19,183	2,548	13,093	11,467	61.75	51.80	1,626	37,429.87	1.88	35.1841	0.0964	0.1795	
	Jefferson	EGS	Port Arthur	4 East	610	2,548	12,913	11,297	59.02	49.96	1,616	1,162.91	2.68	1.5857	0.0043	0.0074	
	Liberty	EGS	Port Arthur	4 East	213	2,548	12,913	11,297	59.02	49.96	1,616	413.05	2.68	0.5537	0.0015	0.0026	
	Montgomery	EGS	Houston	4 East	4,032	2,548	13,093	11,467	61.75	51.80	1,626	7,867.24	2.68	10.5460	0.0289	0.0538	
	Orange	EGS	Port Arthur	4 East	172	2,548	12,913	11,297	59.02	49.96	1,616	333.54	2.68	0.4471	0.0012	0.0021	
	Tarrant	TXU	Fort Worth	5 West	10,358	2,426	15,465	12,448	82.47	61.45	3,017	37,500.10	3.34	62.6252	0.1716	0.3636	
	Waller	Reliant Energy HL & P	Houston	4 East	22	2,548	13,093	11,467	61.75	51.80	1,626	2,047	1.88	0.0508	0.0001	0.0002	
	TOTAL											2,517	297,160.32		417.4298	1.1436	2.0947

**Table 5. ESL Summary table: County-wide NOx Reductions Due to the 2000 IECC (Single Family Residences)**

County	Power Control Area <sup>1</sup>	Primary Electric Utility (From PUCT)	TMY2 <sup>2</sup>	CZ <sup>3</sup>	Division (East or West) <sup>4</sup>	Estimated Total Number of Single Family Houses (2012) <sup>5</sup>	Projected Number of Building Permits for Single Family Houses <sup>6</sup> (2002)	Floor Area (R <sup>2</sup> )	Energy Use per House				Energy Use for New and All Houses For 2002				Energy Savings				Total Savings			Total Savings (PUCT)			2002 Total NOx Emissions from All Single Family Houses				
									1998 Average Annual Energy Use (kWh/House) <sup>7</sup>	IECC 2001 Annual Energy Use (kWh/House) <sup>8</sup>	1999 Peak Day (kWh/House) <sup>10</sup>	IECC Peak Day (kWh/House) <sup>11</sup>	2002 Total Energy Use for New Houses (MWh)	2002 Total Energy Use for All Houses (MWh)	2002 Total Peak Day Energy Use for New Houses (MWh)	2002 Total Peak Day Energy Use for All Houses (MWh)	Annual Savings per House (kWh/House) <sup>12</sup>	Peak Day Energy Savings (kWh/House)	Total Energy Savings (MWh) 1999 IECC w/ 20% T&D Loss <sup>13</sup>	Peak Day Energy Savings for New Houses w/ 20% T&D Loss (MWh) <sup>14</sup>	lb. NOx/MWh <sup>15</sup>	lb. NOx/MWh (PUCT)	Tons/Year <sup>17</sup>	Tons/Day <sup>17</sup>	Peak Tons/Day <sup>17</sup>	Tons/Year	Tons/Day	Peak Tons/Day	Tons/Yr	Peak Tons/Day	
Affected County	Bastrop	ERCOT	ONCOR	Austin	4 West	16,983	146	2,426	16,545	13,310	77.98	69.56	1,843	226,037	9	1,012	3,235	18.42	566.77	3.23	2.69	3.34	0.7623	0.0021	0.0036	0.9465	0.0028	0.0054	377.48	1.69	
	Bexar	ERCOT	Public Service Bd	San Antonio	4 West	405,355	7,168	2,426	16,681	13,332	71.48	55.66	95,564	5,404,196	399	22,553	3,349	15.82	26,806.76	136.09	3.24	2.69	3.24	46.6689	0.1279	0.1837	46.6689	0.1279	0.2205	8,754.80	36.55
	Callwell	ERCOT	CP&AEP	Austin	4 West	9,120	101	2,426	16,545	13,332	77.98	69.56	1,344	121,490	6	644	3,236	18.42	392.08	2.23	2.69	2.69	0.6274	0.0014	0.0026	0.6274	0.0014	0.0030	163.40	0.73	
	Comal	ERCOT	CP&AEP	San Antonio	4 West	26,761	1,111	2,426	16,681	13,332	71.48	55.66	14,812	356,771	62	1,490	3,349	15.82	4,464.89	21.09	2.69	3.24	6.0053	0.0165	0.0236	7.2331	0.0198	0.0342	577.97	2.41	
	Ellis	TXU	ONCOR	Fort Worth	5 West	30,601	649	2,426	15,465	12,448	62.47	61.45	6,079	390,524	40	1,090	3,017	21.02	2,349.64	16.30	3.34	3.24	3.9239	0.0109	0.0228	3.9664	0.0104	0.0266	617.10	3.05	
	Ernst	ERCOT	SWEP&CO(AEP)	Lufkin	6 East	35,150	194	2,548	13,139	11,259	65.34	52.74	2,194	395,716	10	1,854	1,881	12.61	437.90	2.93	2.69	2.69	0.6870	0.0016	0.0033	0.6880	0.0016	0.0039	532.24	2.48	
	Guadalupe	ERCOT	CP&AEP	San Antonio	4 West	26,145	478	2,426	16,681	13,332	71.48	55.66	6,373	348,562	27	1,455	3,349	15.82	1,900.99	9.09	2.69	3.24	2.5837	0.0071	0.0102	3,1120	0.0085	0.0147	564.67	2.36	
	Harrison	ERCOT	SWEP&CO(AEP)	Lufkin	6 East	19,769	33	2,548	13,139	11,259	65.34	52.74	372	222,562	2	1,043	1,881	12.61	74.49	0.50	2.69	2.69	0.0999	0.0003	0.0006	0.1002	0.0003	0.0007	299.36	1.40	
	Hays	ERCOT	ERCOT(San Marcos)	Austin	5 West	29,206	737	2,426	16,662	13,190	76.83	59.29	9,899	371,194	43	1,844	3,502	18.56	3,097.17	16.41	2.69	2.69	4.1657	0.0114	0.0184	4,1502	0.0114	0.0220	497.40	2.20	
	Johnson	TXU	ONCOR	Fort Worth	5 West	35,960	629	2,426	15,465	12,448	62.47	61.45	7,830	447,827	39	2,210	3,017	21.02	2,277.23	15.87	3.34	3.34	3.8930	0.0104	0.0221	3,8033	0.0104	0.0265	747.54	3.69	
	Kaufman	TXU	ONCOR	Fort Worth	5 West	20,036	218	2,426	15,725	12,419	78.10	59.40	2,707	240,824	13	1,170	3,306	19.71	684.95	5.16	3.34	3.34	1,4443	0.0040	0.0072	1,4443	0.0040	0.0096	415.54	1.95	
	Nueces	CRJ	CP&AEP	Corpus Christi	3 East	93,963	841	2,548	14,364	12,651	63.46	56.11	10,639	1,188,725	47	5,272	1,703	7.36	1,718.67	7.42	2.69	2.69	2,3039	0.0063	0.0083	2,3118	0.0063	0.0100	1,598.83	7.09	
	Parker	TXU	ONCOR	Fort Worth	6 West	26,167	302	2,426	15,725	12,419	78.10	59.40	3,751	324,968	18	1,528	3,306	19.71	1,196.09	7.14	3.34	3.34	2,0009	0.0055	0.0099	2,0009	0.0055	0.0119	542.70	2.55	
	Rockwall	TXU	ONCOR	Fort Worth	6 West	13,735	1,111	2,426	15,725	12,419	78.10	59.40	13,798	170,578	65	802	3,306	19.71	4,407.56	26.27	3.34	3.34	7,3606	0.0202	0.0386	7,3606	0.0202	0.0439	264.87	1.34	
	Rusk	SWEP&CO	SWEP&CO(AEP)	Lufkin	6 East	14,834	17	2,548	13,139	11,253	65.34	52.97	191	189,259	1	791	1,996	12.37	30.47	0.25	2.69	2.69	0.0516	0.0001	0.0003	0.0517	0.0001	0.0003	226.03	1.06	
	San Patricio	CRJ	CP&AEP	Corpus Christi	3 East	19,064	218	2,548	14,364	12,651	63.46	56.11	2,758	241,432	12	1,071	1,703	7.36	445.50	1.92	2.69	2.69	0.5972	0.0016	0.0021	0.5992	0.0016	0.0026	324.73	1.44	
	Smith	TXU	ONCOR	Lufkin	6 East	54,706	465	2,548	13,139	11,253	65.34	52.97	5,233	615,604	25	2,898	1,886	12.37	1,052.39	6.90	3.34	3.34	1,7575	0.0048	0.0086	1,7575	0.0048	0.0115	1,028.06	4.84	
	Travis	Austin Energy	ONCOR	Austin	5 West	263,755	5,522	2,426	16,662	13,160	76.83	59.29	77,334	3,471,013	345	15,371	3,502	18.56	24,866.61	131.95	1.44	3.34	17,9184	0.0049	0.0791	41,8606	0.1138	0.2202	5,796.59	25.67	
	Upham	SWEP&CO	SWEP&CO(AEP)	Lufkin	6 East	11,232	17	2,548	13,139	11,258	65.34	52.74	191	126,444	1	692	1,881	12.61	36.37	0.26	2.69	2.69	0.0514	0.0001	0.0003	0.0516	0.0001	0.0003	170.07	0.80	
	Victoria	CRJ	CP&AEP	Victoria	3 East	25,021	165	2,548	13,923	12,251	67.25	60.71	1,311	305,226	9	1,507	1,922	7.04	313.00	1.32	2.69	2.69	0.4196	0.0011	0.0015	0.4210	0.0012	0.0016	412.26	2.03	
Williamson	TXU	ONCOR	Austin	5 West	75,968	4,111	2,426	16,662	13,160	76.83	59.29	54,101	999,709	240	4,427	3,502	18.56	17,276.07	91.53	2.69	3.34	23,1596	0.0634	0.1022	28,9610	0.0790	0.1699	1,699.51	7.39		
Wilson	ERCOT	ERCOT(Floresville)	San Antonio	4 West	9,115	16	2,426	16,681	13,332	71.48	55.66	213	121,515	1	507	3,349	15.82	64.30	0.30	2.69	2.69	0.0965	0.0002	0.0003	0.0962	0.0002	0.0004	162.83	0.69		
Nonattainment County	Bracoria	Reliant Energy	HL & P	Houston	3 East	71,987	2,008	2,548	13,740	11,859	66.52	55.99	23,813	863,694	112	4,000	1,881	10.96	4,532.46	26.39	1.88	1.88	4,2905	0.0117	0.0207	4,2905	0.0117	0.0248	802.47	3.76	
	Chambers	EGS	RELIANT	Port Arthur	4 East	8,388	318	2,548	12,913	11,297	59.02	49.96	3,592	94,769	16	419	1,616	9.06	516.67	3.46	2.69	1.98	0.6286	0.0023	0.0039	0.6297	0.0018	0.0033	89.07	0.39	
	Collin	TXU	ONCOR	Fort Worth	5 West	165,447	9,539	2,426	15,725	12,419	78.10	59.40	119,707	2,054,686	563	9,661	3,306	19.71	38,239.64	227.95	3.34	3.34	63,8605	0.1750	0.3172	63,8605	0.1750	0.3807	3,431.39	16.13	
	Dallas	TXU	ONCOR	Fort Worth	5 West	667,779	6,595	2,426	15,465	12,448	62.47	61.45	106,991	8,108,036	528	40,421	3,017	21.02	31,117.34	216.90	3.34	3.34	51,9600	0.1424	0.3017	61,9660	0.1424	0.3621	13,674.02	67.50	
	Denton	EL PASO Electric Company	EPEC	El Paso	5 West	136,729	5,338	2,426	15,725	12,419	78.10	59.40	66,293	1,898,022	312	7,984	3,306	19.71	21,176.91	126.24	3.34	3.34	35,3654	0.0969	0.1757	35,3654	0.0969	0.2108	2,835.70	13.33	
	El Paso	Reliant Energy	HL & P	Houston	4 East	89,051	1,049	2,548	13,083	11,467	61.75	51.80	12,029	1,021,609	54	4,615	1,626	9.96	2,046.81	12.53	1.88	1.88	1,9240	0.0053	0.0086	1,9240	0.0053	0.0118	960.31	4.34	
	Galveston	Reliant Energy	HL & P	Houston	3 East	89,476	2,338	2,548	13,740	11,859	66.52	55.99	27,726	1,049,234	130	4,916	1,881	10.96	5,277.33	30.73	1.88	1.88	4,9607	0.0136	0.0241	4,9607	0.0136	0.0289	996.28	4.62	
	Harris	Reliant Energy	HL & P	Houston	4 East	14,915	19	2,548	12,913	11,297	59.02	49.96	215	168,495	1	745	1,616	9.06	36.94	0.21	2.69	2.07	0.0494	0.0001	0.0002	0.0491	0.0001	0.0002	174.39	0.77	
	Harris	Reliant Energy	HL & P	Houston	4 East	1,011,964	19,163	2,548	13,083	11,467	61.75	51.80	219,971	11,804,195	994	52,417	1,626	9.96	37,429.87	229.18	1.88	1.88	35,1941	0.0664	0.1795	35,1941	0.0664	0.2154	10,907.93	49.27	
	Jefferson	EGS	ENERGY	Port Arthur	4 East	77,780	610	2,548	12,913	11,297	59.02	49.96	6,891	676,811	30	3,886	1,616	9.06	1,152.91	6.83	2.69	2.07	1,5857	0.0043	0.0074	1,2245	0.0034	0.0069	909.45	4.02	
	Liberty	EGS	ENERGY	Port Arthur	4 East	20,195	213	2,548	12,913	11,297	59.02	49.96	2,406	228,146	11	1,039	1,616	9.06	413.05	2.32	2.69	2.07	0.5532	0.0015	0.0026	0.4275	0.0012	0.0024	236.13	1.04	
	Montgomery	EGS	ENERGY	Houston	4 East	92,642	4,032	2,548	13,083	11,467	61.75	51.80	46,236	1,062,320	209	4,799	1,626	9.96	7,867.24	48.17	2.69	2.07	10,5460	0.0299	0.0538	8,1426	0.0223	0.0489	1,099.60	4.97	
	Orange	EGS	ENERGY	Port Arthur	4 East	26,430	172	2,548	12,913	11,297	59.02	49.96	1,843	298,577	9	1,320	1,616														



Nonattainment and Affected Counties	Electric Retail Service Area	Power Control Area	NERC Region	Total Energy Savings by County (MWh)	Total Energy Savings by PCA (MWh)	NOx Emission Reduction by County (Tons/yr)	NOx Emission Reduction by PCA (Tons/yr)
Travis	Austin Energy	Austin Energy/PCA	ERCOT	24,886.6		17,918.4	
		Austin Energy/PCA			24,886.6		17,918.4
Nueces	CRI	American Electric Power West (ERCOT)/PCA	ERCOT	1,718.7		2,303.9	
San Patricio	CRI	American Electric Power West (ERCOT)/PCA	ERCOT	445.5		0,597.2	
Victoria	CRI	American Electric Power West (ERCOT)/PCA	ERCOT	313.0		0,419.6	
		American Electric Power West (ERCOT)/PCA			2,477.2		3,320.7
Bastrop		Lower Colorado River Authority/PCA	ERCOT	566.8		0,762.3	
Caldwell		Lower Colorado River Authority/PCA	ERCOT	392.1		0,527.4	
Comal		Lower Colorado River Authority/PCA	ERCOT	4,464.9		6,005.3	
Guadalupe		Lower Colorado River Authority/PCA	ERCOT	1,921.0		2,583.7	
Hays		Lower Colorado River Authority/PCA	ERCOT	3,097.2		4,165.7	
Wilson		Lower Colorado River Authority/PCA	ERCOT	64.3		0,086.5	
		Lower Colorado River Authority/PCA			10,506.2		14,130.9
Brazoria	Reliant Energy HL&P	Reliant Energy HL&P/PCA	ERCOT	4,532.5		4,260.5	
Fort Bend	Reliant Energy HL&P	Reliant Energy HL&P/PCA	ERCOT	2,046.8		1,924	
Galveston	Reliant Energy HL&P	Reliant Energy HL&P/PCA	ERCOT	5,277.3		4,960.7	
Harris	Reliant Energy HL&P	Reliant Energy HL&P/PCA	ERCOT	37,429.9		35,184.1	
Waller	Reliant Energy HL&P	Reliant Energy HL&P/PCA	ERCOT	54.0		0,050.8	
		Reliant Energy HL&P/PCA			49,340.5		46,380.1
Bexar	San Antonio Public Service Bd	San Antonio Public Service Bd/PCA	ERCOT	28,806.8		46,666.9	
		San Antonio Public Service Bd/PCA			28,806.8		46,666.9
Ellis	TXU	TXU Electric/PCA	ERCOT	2,349.6		3,923.9	
Johnson	TXU	TXU Electric/PCA	ERCOT	2,277.2		3,803	
Kaufman	TXU	TXU Electric/PCA	ERCOT	864.8		1,444.3	
Parker	TXU	TXU Electric/PCA	ERCOT	1,198.1		2,000.8	
Rockwall	TXU	TXU Electric/PCA	ERCOT	4,407.6		7,360.6	
Smith	TXU	TXU Electric/PCA	ERCOT	1,052.4		1,757.5	
Williamson	TXU	TXU Electric/PCA	ERCOT	17,276.1		23,158.6	
Collin	TXU	TXU Electric/PCA	ERCOT	38,239.8		63,860.5	
Dallas	TXU	TXU Electric/PCA	ERCOT	31,117.3		51,966	
Denton	TXU	TXU Electric/PCA	ERCOT	21,176.9		36,365.4	
Tarrant	TXU	TXU Electric/PCA	ERCOT	37,500.1		62,625.2	
		TXU Electric/PCA			157,460.0		258,265.8
Chambers	EGS	Entergy Electric System/PCA	SERC	616.7		0,826.6	
Hardin	EGS	Entergy Electric System/PCA	SERC	36.8		0,049.4	
Jefferson	EGS	Entergy Electric System/PCA	SERC	1,182.9		1,585.7	
Liberty	EGS	Entergy Electric System/PCA	SERC	413.0		0,553.7	
Montgomery	EGS	Entergy Electric System/PCA	SERC	7,867.2		10,546	
Orange	EGS	Entergy Electric System/PCA	SERC	333.5		0,447.1	
		Entergy Electric System/PCA			10,450.3		14,008.5
El Paso	EL PASO Electric Company	El Paso Electric Co/PCA	WSCC	12,643.6		16,948.7	
		El Paso Electric Co/PCA			12,643.6		16,948.7
Gregg	SWEP/CO	Southwestern Public Service Co/PCA	SPP	437.9		0,587	
Harrison	SWEP/CO	Southwestern Public Service Co/PCA	SPP	74.5		0,099.9	
Rusk	SWEP/CO	Southwestern Public Service Co/PCA	SPP	38.5		0,051.6	
Upshur	SWEP/CO	Southwestern Public Service Co/PCA	SPP	38.4		0,051.4	
		Southwestern Public Service Co/PCA			589.2		0,789.9
<b>Total</b>				<b>297,160.3</b>	<b>297,160.3</b>	<b>418,429.9</b>	<b>418,429.9</b>

**Table 7. Total Annual Electricity Savings Due to The 2000 IECC by Power Control Area (Single Family Residences)**



Nonattainment and Affected Counties	Electric Retail Service Area	Power Control Area	NERC Region	Peakday Energy Savings by County (MWh)	Peakday Energy Savings by PCA (MWh)	NOx Emission Reduction by County (Tons/day)	NOx Emission Reduction by PCA (Tons/day)
Travis	Austin Energy	Austin Energy/PCA	ERCOT	131.85		0.2202	
		Austin Energy/PCA			131.8		0.2202
Nueces	CRI	American Electric Power West (ERCOT)/PCA	ERCOT	7.42		0.0100	
San Patricio	CRI	American Electric Power West (ERCOT)/PCA	ERCOT	1.92		0.0026	
Victoria	CRI	American Electric Power West (ERCOT)/PCA	ERCOT	1.32		0.0018	
		American Electric Power West (ERCOT)/PCA			10.7		0.0143
Bastrop		Lower Colorado River Authority/PCA	ERCOT	3.23		0.0054	
Caldwell		Lower Colorado River Authority/PCA	ERCOT	2.23		0.0030	
Comal		Lower Colorado River Authority/PCA	ERCOT	21.09		0.0342	
Guadalupe		Lower Colorado River Authority/PCA	ERCOT	9.08		0.0147	
Hays		Lower Colorado River Authority/PCA	ERCOT	16.41		0.0220	
Wilson		Lower Colorado River Authority/PCA	ERCOT	0.30		0.0004	
		Lower Colorado River Authority/PCA			52.3		0.0797
Brazoria	Reliant Energy HL&P	Reliant Energy HL&P/PCA	ERCOT	26.39		0.0248	
Fort Bend	Reliant Energy HL&P	Reliant Energy HL&P/PCA	ERCOT	12.53		0.0118	
Galveston	Reliant Energy HL&P	Reliant Energy HL&P/PCA	ERCOT	30.73		0.0289	
Harris	Reliant Energy HL&P	Reliant Energy HL&P/PCA	ERCOT	229.18		0.2154	
Waller	Reliant Energy HL&P	Reliant Energy HL&P/PCA	ERCOT	0.26		0.0002	
		Reliant Energy HL&P/PCA			299.1		0.2812
Bexar	San Antonio Public Service Bd	San Antonio Public Service Bd/PCA	ERCOT	136.09		0.2205	
		San Antonio Public Service Bd/PCA			136.1		0.2205
Ellis	TXU	TXU Electric/PCA	ERCOT	16.37		0.0265	
Johnson	TXU	TXU Electric/PCA	ERCOT	15.87		0.0265	
Kaufman	TXU	TXU Electric/PCA	ERCOT	5.16		0.0086	
Parker	TXU	TXU Electric/PCA	ERCOT	7.14		0.0119	
Rockwall	TXU	TXU Electric/PCA	ERCOT	26.27		0.0439	
Smith	TXU	TXU Electric/PCA	ERCOT	6.90		0.0115	
Williamson	TXU	TXU Electric/PCA	ERCOT	91.53		0.1528	
Collin	TXU	TXU Electric/PCA	ERCOT	227.95		0.3607	
Dallas	TXU	TXU Electric/PCA	ERCOT	216.80		0.3621	
Denton	TXU	TXU Electric/PCA	ERCOT	126.24		0.2108	
Tarrant	TXU	TXU Electric/PCA	ERCOT	261.27		0.4363	
		TXU Electric/PCA			1,001.5		1.6717
Chambers	EGS	Entergy Electric System/PCA	SERC	3.46		0.0033	
Hardin	EGS	Entergy Electric System/PCA	SERC	0.21		0.0002	
Jefferson	EGS	Entergy Electric System/PCA	SERC	6.63		0.0069	
Liberty	EGS	Entergy Electric System/PCA	SERC	2.32		0.0024	
Montgomery	EGS	Entergy Electric System/PCA	SERC	48.17		0.0499	
Orange	EGS	Entergy Electric System/PCA	SERC	1.87		0.0019	
		Entergy Electric System/PCA			62.7		0.0645
El Paso	EL PASO Electric Company	El Paso Electric Co/PCA	WSCC	75.15		0.0988	
		El Paso Electric Co/PCA			75.1		0.0988
Gregg	SWEP/CO	Southwestern Public Service Co/PCA	SPP	2.93		0.0039	
Harrison	SWEP/CO	Southwestern Public Service Co/PCA	SPP	0.50		0.0007	
Rusk	SWEP/CO	Southwestern Public Service Co/PCA	SPP	0.25		0.0003	
Upshur	SWEP/CO	Southwestern Public Service Co/PCA	SPP	0.26		0.0003	
		Southwestern Public Service Co/PCA			3.9		0.0053
<b>Total</b>				<b>1,773.3</b>	<b>1,773.3</b>	<b>2.6561</b>	<b>2.6561</b>

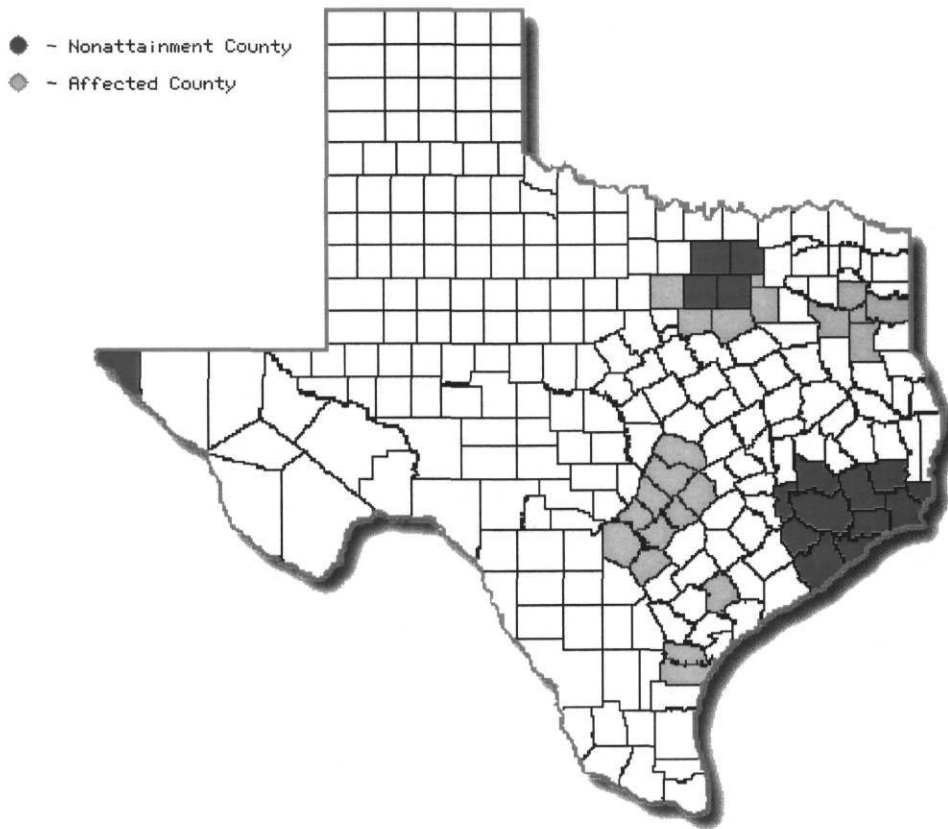
**Table 8. Peak Day Electricity Savings Due to The 2000 IECC by Power Control Area (Single Family Residences)**

County	American Electric Power - West (ERCOT)/PCA	
BASTROP	0.01	24.77
BEXAR	0.06	148.63
BRAZORIA	0.01	24.77
BRAZOS	0.00	0.00
CALHOUN	0.19	470.66
CAMERON	0.14	346.80
CHAMBERS	0.05	123.86
CHEROKEE	0.01	24.77
COKE	0.03	74.32
COLEMAN	0.02	49.54
COLLIN	0.01	24.77
CROCKETT	0.14	346.80
DALLAS	0.06	148.63
DENTON	0.00	0.00
FANNIN	0.02	49.54
FAYETTE	0.02	49.54
FORT BEND	0.13	322.03
FREESTONE	0.02	49.54
FRIO	0.05	123.86
GALVESTON	0.05	123.86
GRIMES	0.01	24.77
HARDEMAN	0.01	24.77
HARRIS	0.05	123.86
HASKELL	0.16	396.35
HENDERSON	0.00	0.00
HIDALGO	0.13	322.03
HOOD	0.02	49.54
JOHNSON	0.00	0.00
JONES	0.14	346.80
LAMAR	0.00	0.00
LIMESTONE	0.01	24.77
LLANO	0.00	0.00
MCLENNAN	0.04	99.09
MITCHELL	0.04	99.09
NOLAN	0.00	0.00
NUECES	0.74	1833.11
PALO PINTO	0.01	24.77
PARKER	0.00	0.00
RED RIVER	0.00	0.00
ROBERTSON	0.00	0.00
RUSK	0.01	24.77
TARRANT	0.04	99.09
TAYLOR	0.01	24.77
TITUS	0.01	24.77
TRAVIS	0.00	0.00
VICTORIA	0.30	743.15
WARD	0.06	148.63
WEBB	0.06	148.63
WHARTON	0.00	0.00
YOUNG	0.02	49.54
<b>TOTAL</b>	<b>2.90</b>	<b>7183.80</b>
Energy Savings by PCA from ESL	2477.1708	

**Table 9.** Example of Calculation for American Electric Power/PCA and Bastrop County

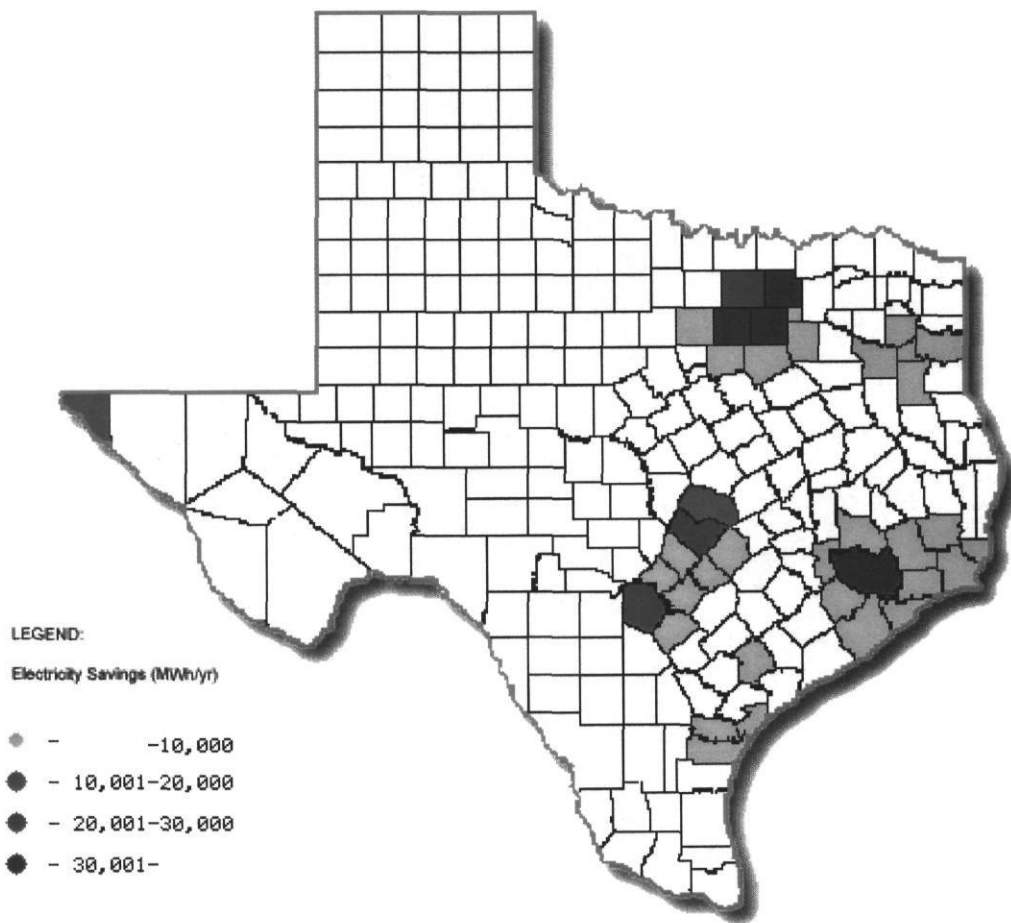


Area	County	American Electric Power West (ERCOT) /PCA	NOx Reductions (lbs)	Austin Energy/PCA	NOx Reductions (lbs)	Brownsville Public Life Board/PCA	NOx Reductions (lbs/year)	Lower Colorado River Authority /PCA	NOx Reductions (lbs)	Reliant Energy HLAP/PCA	NOx Reductions (lbs)	San Antonio Public Service Bd/PCA	NOx Reductions (lbs)	South Texas Electric Coop /PCA	NOx Reductions (lbs)	Texas Municipal Power Pool/PCA	NOx Reductions (lbs)	Texas-New Mexico Power Co/PCA	NOx Reductions (lbs)	TXU Electric/PCA	NOx Reductions (lbs)	Tc Re
Austin Area	BASTROP	0.01	0.11	0.20	26.37		0.00	0.34	17.80		0.00	0.01	1.36		0.00		0.00		0.00		0.00	
	BEKAR	0.06	0.64	0.09	11.67	0.04	0.00	0.16	8.37		0.00	2.00	272.19	0.06	0.00	0.01	0.00		0.00		0.00	
	TRAVIS	0.00	0.00	0.46	80.55		0.00	0.06	2.62		0.00				0.00		0.00		0.00		0.00	
	FAYETTE	0.02	0.21	0.26	113.39	0.02	0.00	1.61	75.03	0.01	2.99	0.04	6.44	0.01	0.00	0.02	0.00		0.00	0.02	0.00	20.03
	LLANO	0.00	0.00	0.12	16.82		0.00	0.21	10.99		0.00	0.01	1.36		0.00	0.00	0.00		0.00		0.00	
	CALDWELL	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
	COMAL	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
	GLADLIPPE	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
	HAYS	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
	WILLIAMSON	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
San Antonio Area	WILSON	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
	COLLIN	0.01	0.11	0.01	1.32		0.00	0.02	1.06	0.01	2.99		0.00	0.06	0.00	0.19	0.00		0.00	0.00	0.02	20.03
	DALLAS	0.06	0.64	0.06	7.91	0.04	0.00	0.09	4.71	0.03	8.97	0.01	1.36	0.09	0.00	0.30	0.00	0.09	0.00	0.01	0.51	516.76
	DENTON	0.00	0.00	0.01	1.32		0.00	0.01	0.52		0.00	0.00	0.00	0.04	0.00	0.16	0.00		0.00	0.01	10.91	
	JOHNSON	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
	PAIKER	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.01	0.00	0.03	0.00		0.00		0.00
	CHEROKEE	0.01	0.11	0.01	1.32	0.01	0.00	0.02	1.06	0.00	2.99		0.00	0.02	0.00	0.06	0.00	0.02	0.00	0.10	100.15	
	COKE	0.03	0.32	0.00	0.00	0.02	0.00	0.00	0.00		0.00	0.00	0.00	0.01	0.00	0.00	0.00		0.00		0.00	
	COLEMAN	0.02	0.21	0.00	0.00	0.01	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
	FANNIN	0.02	0.21	0.02	2.64	0.01	0.00	0.03	1.57	0.01	2.99		0.00	0.03	0.00	0.09	0.00	0.03	0.00	0.17	172.25	
Dallas-Fort Worth Area	FRIO	0.06	0.63	0.00	0.00	0.04	0.00	0.01	0.52		0.00	0.00	1.16	0.00	0.07	0.00	0.00		0.00		0.00	
	HARDEMAN	0.01	0.11	0.00	0.00	0.01	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
	HASKELL	0.16	1.71	0.00	0.00	0.12	0.00	0.01	0.52		0.00	0.00	0.00	0.03	0.00	0.01	0.00		0.00	0.01	10.91	
	HEWNERSON	0.00	0.00	0.00	0.00		0.00	0.01	0.52		0.00	0.00	0.00		0.00	0.00	0.00	0.01	0.00	0.03	30.04	
	HOOD	0.02	0.21	0.02	2.64	0.02	0.00	0.04	2.08	0.01	2.99		0.00	0.03	0.00	0.12	0.00	0.04	0.00	0.22	222.25	
	JONES	0.14	1.49	0.00	0.00	0.11	0.00	0.00	0.00		0.00	0.00	0.00		0.03	0.00	0.00		0.00	0.01	10.91	
	LAMAR	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.01	10.91	
	LIMESTONE	0.01	0.11	0.01	1.32		0.00	0.00	0.00	0.05	14.96	0.01	1.36		0.00	0.00	0.00		0.00		0.00	
	MCLENNAN	0.04	0.43	0.04	5.27	0.03	0.00	0.07	3.68	0.03	5.90	0.01	1.36	0.06	0.00	0.22	0.00	0.07	0.00	0.40	400.50	
	Houston Area	MITCHELL	0.04	0.43	0.04	5.27	0.03	0.00	0.07	3.68	0.02	5.90	0.01	1.36	0.06	0.00	0.21	0.00	0.07	0.00	0.39	390.56
NOLAN		0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.01	10.91	
PALO PINTO		0.01	0.11	0.02	2.64	0.01	0.00	0.03	1.57	0.01	2.99		0.00	0.09	0.00	0.36	0.00	0.00	0.02	20.03		
RED RIVER		0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.02	20.03	
TAYLOR		0.01	0.11	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
TITUS		0.01	0.11	0.01	1.32	0.01	0.00	0.02	1.06	0.00	2.99		0.00	0.02	0.00	0.05	0.00	0.02	0.00	0.10	100.15	
YOUNG		0.02	0.21	0.02	2.64	0.01	0.00	0.03	1.57	0.01	2.99		0.00	0.03	0.00	0.09	0.00	0.03	0.00	0.16	160.24	
TARRANT		0.04	0.43	0.04	5.27	0.03	0.00	0.06	3.14	0.02	5.90	0.01	1.36	0.06	0.00	0.18	0.00	0.06	0.00	0.33	330.49	
ELLIS		0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
KAUFMAN		0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
Galveston Area	ROCKWALL	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
	BRAZORIA	0.01	0.11	0.01	1.32		0.00	0.00	0.00	0.05	14.96	0.01	1.36		0.00	0.00	0.00		0.00		0.00	
	BRAZOS	0.00	0.00	0.01	1.32		0.00	0.01	0.52		0.00		0.00	0.03	0.00	0.11	0.00		0.00	0.01	10.91	
	GRIMES	0.01	0.11	0.01	1.32		0.00	0.02	1.06	0.01	2.99		0.00	0.06	0.00	0.23	0.00	0.00	0.00	0.01	10.91	
	WHARTON	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	2.99		0.00		0.00	0.00	0.00		0.00		0.00	
	CHAMBERS	0.05	0.53	0.06	7.91	0.03	0.00	0.02	1.06	0.35	104.89	0.09	10.89	0.03	0.00	0.02	0.00	0.02	0.00	0.03	30.04	
	FORT BEND	0.13	1.39	0.17	22.41	0.10	0.00	0.06	3.14	1.01	302.10	0.23	31.30	0.09	0.00	0.06	0.00	0.07	0.00	0.10	100.15	
	GALVESTON	0.06	0.63	0.06	7.91	0.04	0.00	0.02	1.06	0.39	116.65	0.09	12.25	0.04	0.00	0.03	0.00	0.42	0.00	0.04	40.06	
	ROBERTSON	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.01	2.99		0.00		0.00	0.00	0.00	0.40	0.00	0.01	10.91	
	HARRIS	0.05	0.53	0.07	9.23	0.04	0.00	0.02	1.06	0.41	122.63	0.09	12.25	0.04	0.00	0.02	0.00	0.03	0.00	0.04	40.06	
El Paso Area	HARRIN	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
	JEFFERSON	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
	LIBERTY	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
	MONTGOMERY	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
	ORANGE	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
	WALLER	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
	EL PASO	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00		0.00	
	RUSK	0.01	0.11	0.01	1.32	0.01	0.00	0.01	0.52		0.00	0.00	0.00	0.01	0.00	0.04	0.00	0.01	0.00	0.07	70.10	
	CROCKETT	0.14	1.49	0.00	0.00	0.11	0.00	0.00	0.00		0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.01	10.91		
	ETC	FREESTONE	0.02	0.21	0.02	2.64	0.02	0.00	0.04	2.08	0.01	2.99		0.00</								

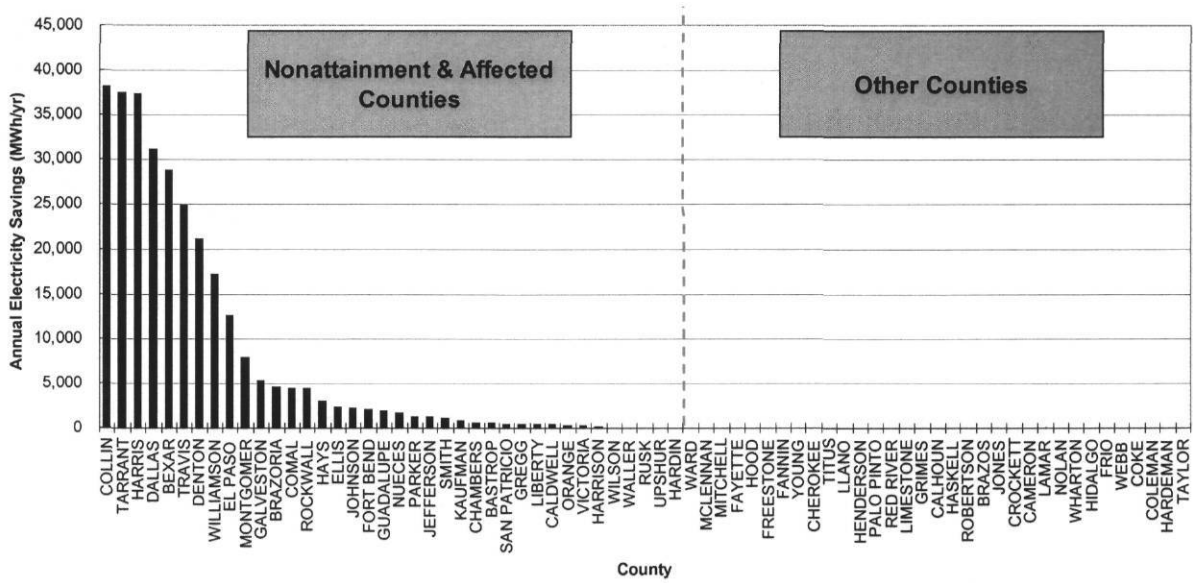


**Figure 1.** Distribution of the Non-attainment & Affected Counties in Texas

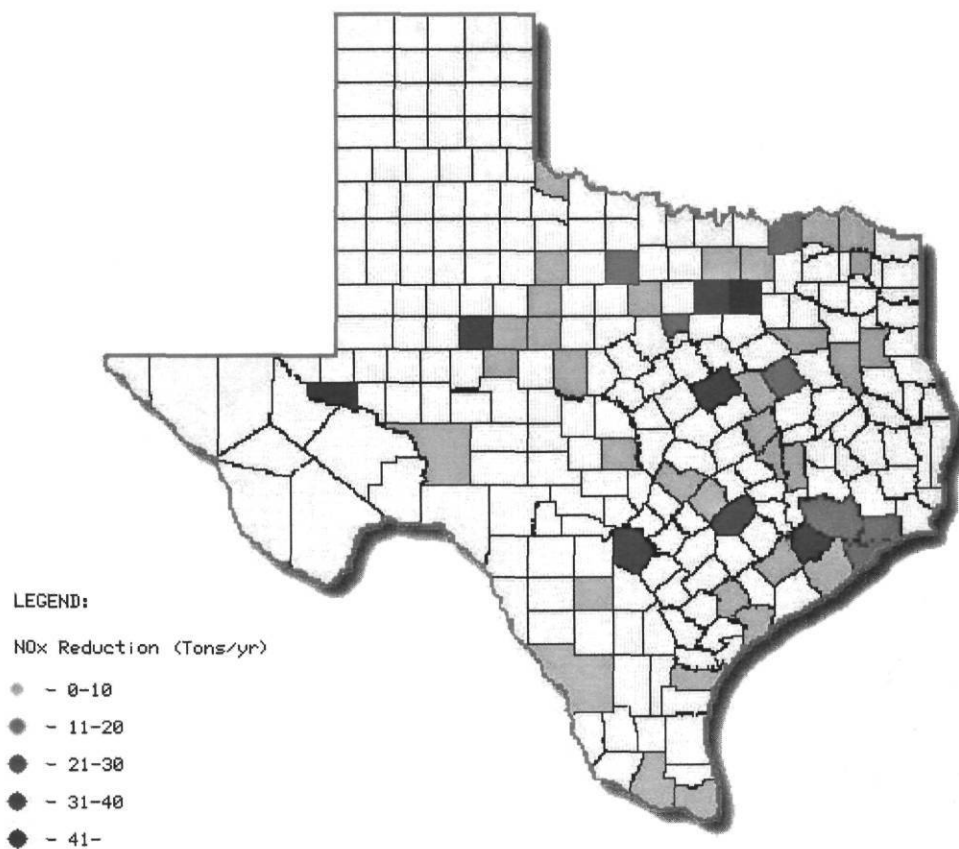




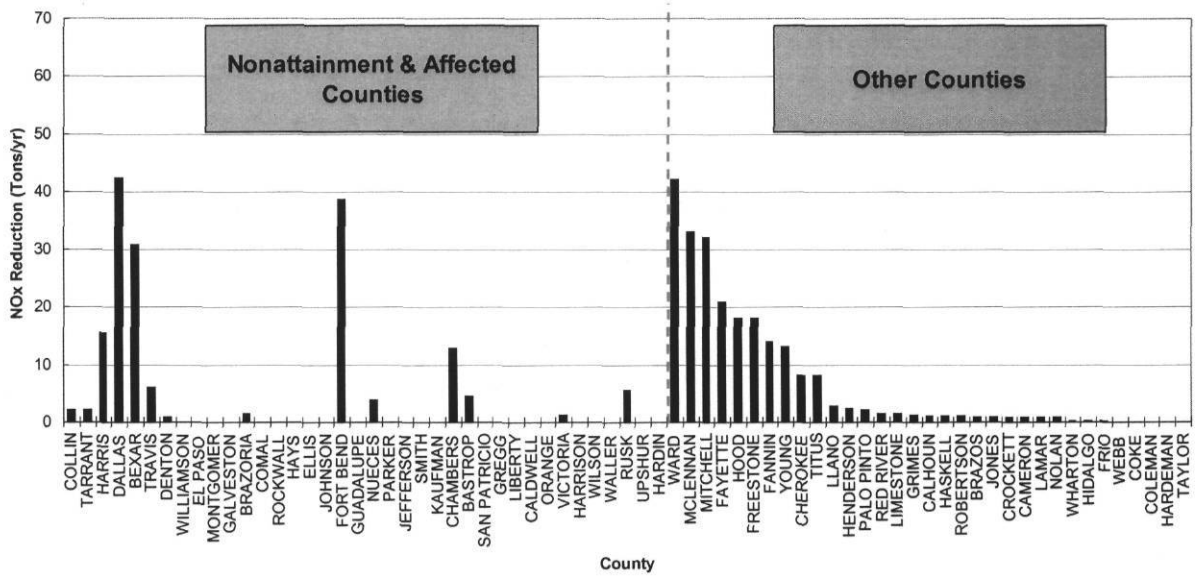
**Figure 2.** Distribution of 2002 Annual Electricity Savings Due To the 2000 IECC (Single Family Residential)



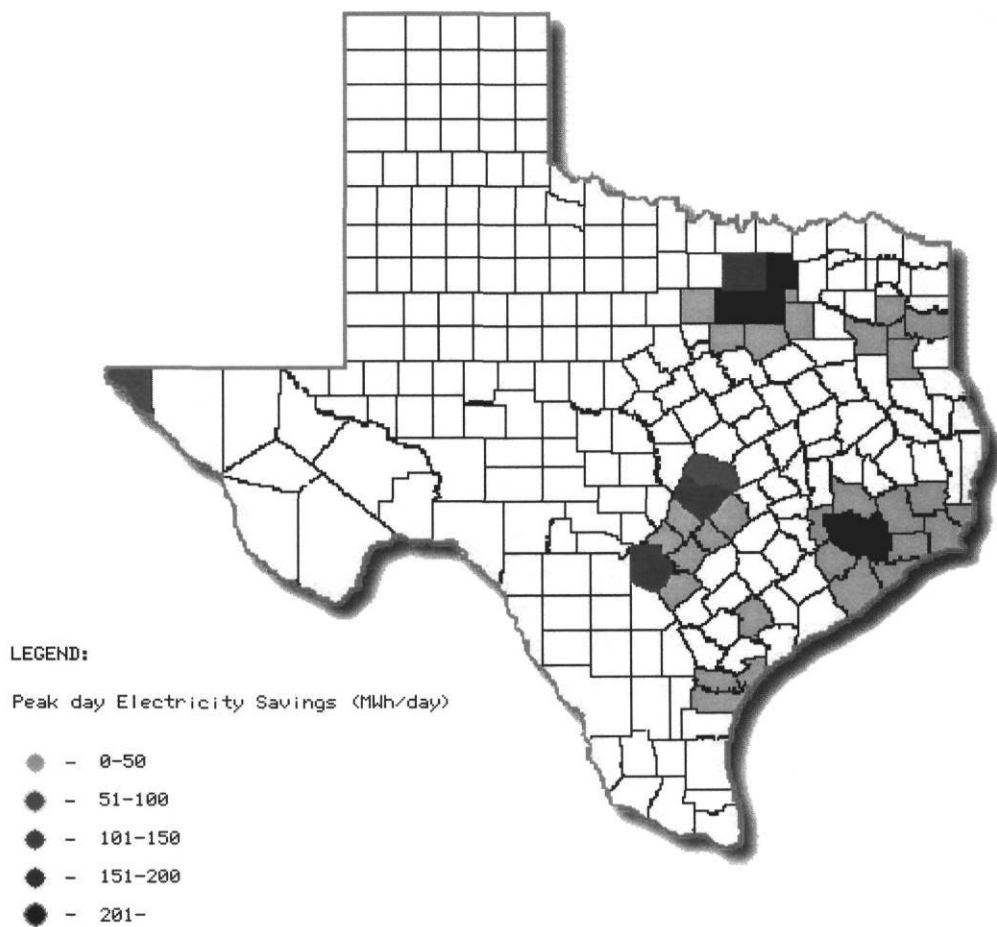
**Figure 3.** 2002 Annual Electricity Savings Due To the 2000 IECC (Single Family Residential)



**Figure 4.** Distribution of Power Plant Annual NOx Reductions Due To The 2000 IECC (Single Family Residential)



**Figure 5.** Power Plant Annual NOx Reductions Due To The 2000 IECC (Single Family Residential)



**Figure 6.** Distribution of 2002 Peak day Electricity Savings Due To the 2000 IECC (Single Family Residential)



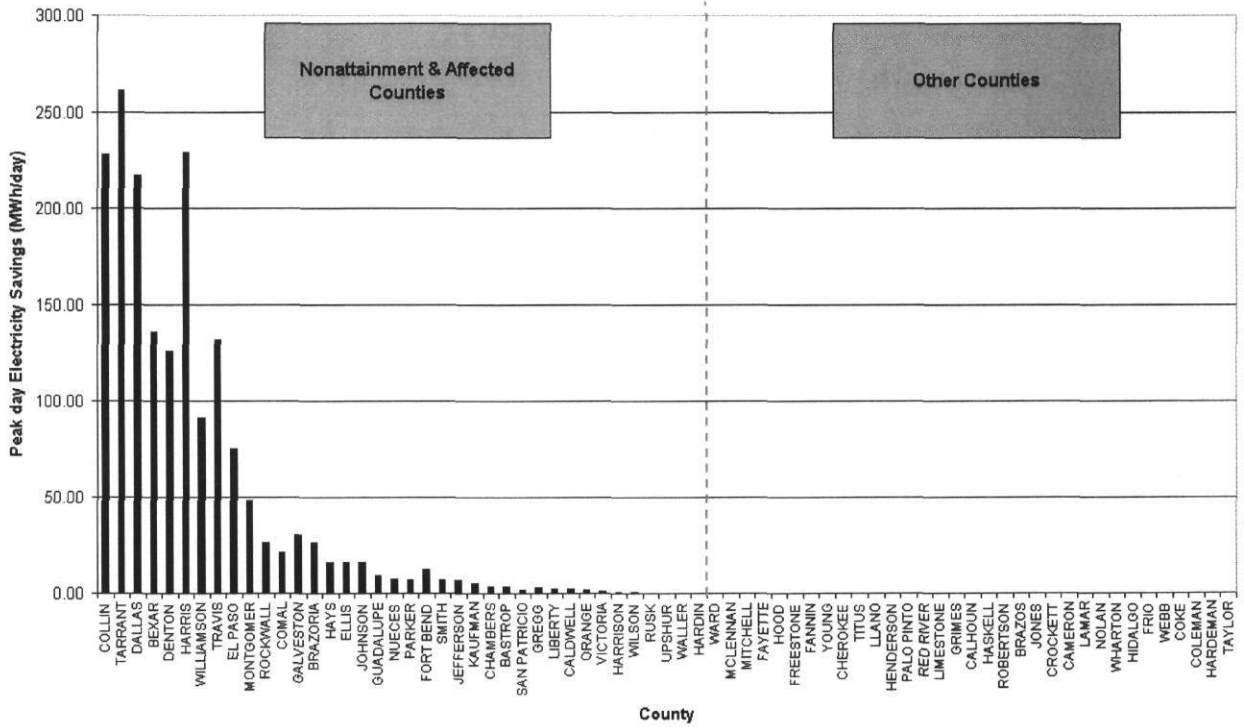
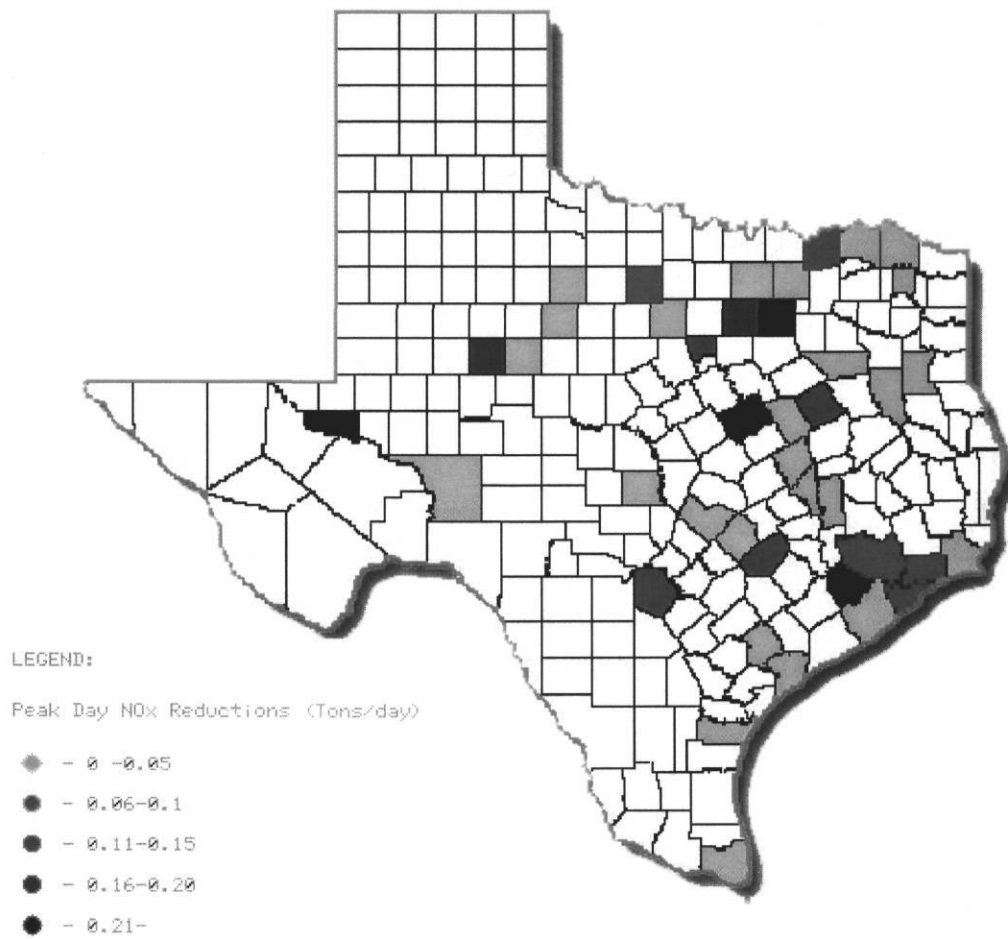


Figure 7. 2002 Peak day Electricity Savings Due To the 2000 IECC (Single Family Residential)



**Figure 8.** Distribution of Power Plant Peak Day NOx Reductions Due To The 2000 IECC (Single Family Residential)

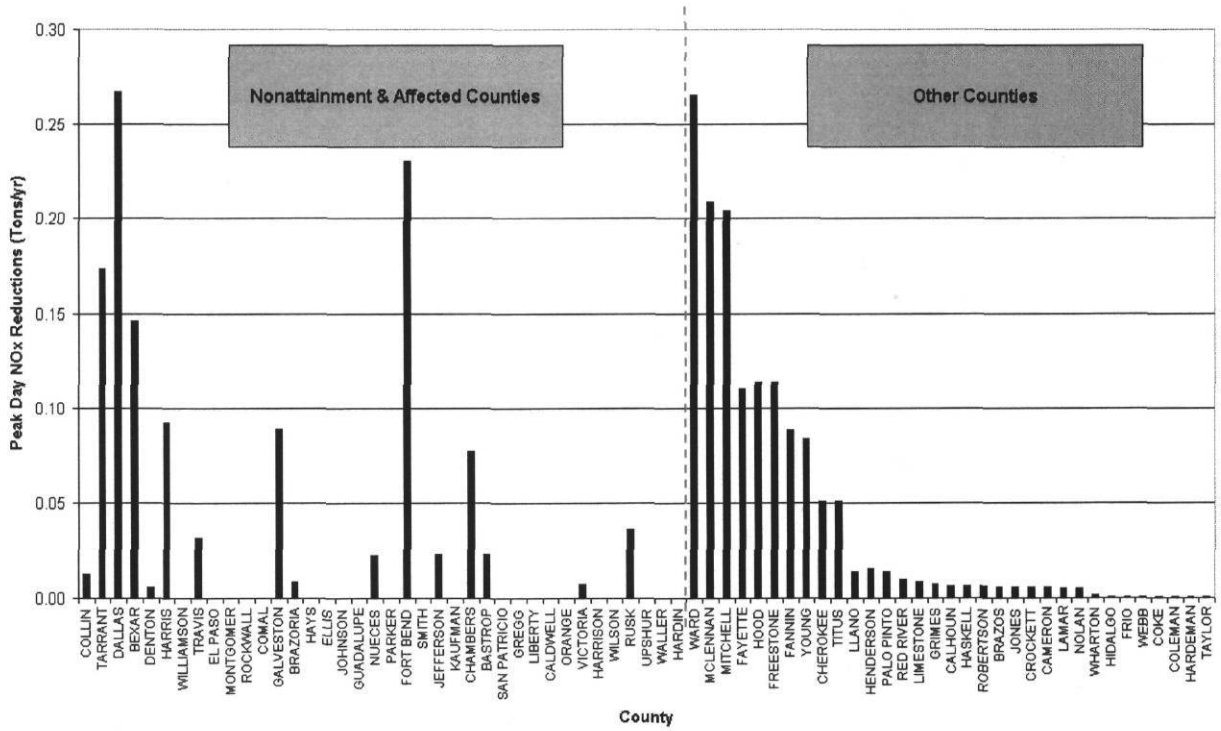


Figure 9. Power Plant Peak day NOx Reductions Due To The 2000 IECC (Single Family Residential)