

**ENERGY EFFICIENCY/RENEWABLE ENERGY IMPACT  
IN THE TEXAS EMISSIONS REDUCTION PLAN (TERP)**

**VOLUME II—TECHNICAL APPENDIX**

**Annual Report to the  
Texas Commission on Environmental Quality  
January 2017-December 2017**



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December 2018



**ENERGY SYSTEMS LABORATORY**  
TEXAS A&M ENGINEERING EXPERIMENT STATION



**TEXAS A&M ENGINEERING  
EXPERIMENT STATION**

**Energy Systems Laboratory**

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December 10, 2018

Robert Gifford  
Air Quality Planning Section  
Air Quality Division, Office of Air  
Texas Commission on Environmental Quality Austin, TX 78711-3087

Dear Gifford:

The Energy Systems Laboratory (ESL) at the Texas A&M Engineering Experiment Station of the Texas A&M University System is pleased to provide its annual report, "Energy Efficiency/Renewable Energy Impact in the Texas Emissions Reduction Plan (TERP)," as required under Texas Health and Safety Code 386.205, 386.252, 388.006, 389.003 (e), and under Texas Utilities Code Sec. 39.9051 (g) (h), and Sec. 39.9052 (c) (d).

The ESL is required to annually report the energy savings from statewide adoption of the Texas Building Energy Performance Standards in Senate Bill 5 (SB 5), as amended, and the relative impact of proposed local energy code amendments in the Texas non-attainment and near-non-attainment counties as part of the Texas Emissions Reduction Plan (TERP).

Please contact me at (979) 845-9213 should you or any of the TCEQ staff have any questions concerning this report or any of the work presently being done to quantify emissions reduction from energy efficiency and renewable energy measures as a result of the TERP implementation.

Sincerely,

David E. Claridge, Ph.D., P.E., FASHRAE  
Director

Enclosure

cc: Commissioner Jon Niermann  
Commissioner Emily Lindley  
Executive Director Toby Baker

#### Disclaimer

This report is provided by the Energy Systems Laboratory of the Texas A&M Engineering Experiment Station (TEES) as required under Sections 386.205, 386.252, 388.006, and 388.003 (e) of the Texas Health and Safety Code and Sections 39.9051 (g) (h), and 39.9052 (c) (d) of the Texas Utilities Code. The information provided in this report is intended to be the best available information at the time of publication. TEES makes no claim or warranty, express or implied, that the report or data herein is necessarily error-free. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not constitute or imply its endorsement, recommendation, or favoring by the Energy Systems Laboratory or any of its employees. The views and opinions of authors expressed herein do not necessarily state or reflect those of the Texas A&M Engineering Experiment Station or the Energy Systems Laboratory.

## VOLUME II – APPENDIX

Energy Efficiency/Renewable Energy Impact  
In The Texas Emissions Reduction Plan

## 1 EXECUTIVE SUMMARY

The Energy Systems Laboratory (Laboratory), a division of the Texas A&M Engineering Experiment Station and a member of The Texas A&M University System, in fulfillment of its responsibilities under Sections 386.205, 386.252, 388.006, and 388.003 (e) of the Texas Health and Safety Code and Sections 39.9051 (g) (h), and 39.9052 (c) (d) of the Texas Utilities Code, submits its annual report, Energy Efficiency/Renewable Energy (EE/RE) Impact in the Texas Emissions Reduction Plan (TERP) to the Texas Commission on Environmental Quality.

The report is organized in two volumes:

- Volume I – Technical Report – provides a detailed report of activities, methodologies and findings, including an executive summary and overview;
- Volume II – Technical Appendix – contains detailed data from simulations for each of the counties included in the analysis.

Accomplishments are as follow:

## 1.1 Energy Code Amendments

The Laboratory was requested by several Council of Governments (COGs) and municipalities to analyze the stringency of several proposed residential and commercial energy code amendments, including: the 2015 IECC and the ASHRAE Standards 90.1-2013. Results of the analysis are included in the Volume I – Technical Report.

## 1.2 Technical Assistance

The Laboratory provided technical assistance to the TCEQ, PUCT, SECO, ERCOT, and several political subdivisions, as well as Stakeholders participating in improving the compliance of the Texas Building Energy Performance Standards (TBEPS). The Laboratory also worked closely with the TCEQ to refine the integrated NO<sub>x</sub> emissions reduction calculation procedures that provide the TCEQ with a standardized, creditable NO<sub>x</sub> emissions reduction from energy efficiency and renewable energy (EE/RE) programs, which are acceptable to the US EPA. These activities have improved the accuracy of the creditable NO<sub>x</sub> emissions reduction from EE/RE initiatives contained in the TERP and have assisted the TCEQ, local governments, and the building industry with effective, standardized implementation and reporting.

1.3 NO<sub>x</sub> Emissions Reduction

Under the TERP legislation, the Laboratory must determine the energy savings from energy code adoption and, when applicable, from more stringent local codes or above-code performance ratings, and must report these reductions annually to the TCEQ. Figure 1 shows the integrated NO<sub>x</sub> emissions reduction through 2022 for the electricity and natural gas savings from the various EE/RE programs.

In 2017, the annual NO<sub>x</sub> emissions reduction from code-compliant residential and commercial construction is calculated to be 1,024 tons-NO<sub>x</sub>/year (3.1% of the total NO<sub>x</sub> savings), savings from the PUC's Senate Bill 7 programs will be 1,326 tons-NO<sub>x</sub>/year (4.0%), savings from SECO's Senate Bill 5 program will be 517 tons-NO<sub>x</sub>/year (1.6%), electricity savings from green power purchases (wind) will be 30,212 tons-

NOx/year (91.1%), and savings from residential air conditioner retrofits will be 72 tons-NOx/year (0.2%). The total annual NOx emissions reduction from all programs will be 33,150 tons-NOx/year.

By 2022, the annual NOx emissions reduction from code-compliant residential and commercial construction is calculated to be 2,719 tons-NOx/year (5.3% of the total NOx savings), savings from the PUC’s Senate Bill 7 programs is 1,833 tons-NOx/year (3.6%), savings from SECO’s Senate Bill 5 program is 1,285 tons-NOx/year (2.5%), electricity savings from green power purchases (wind) are 45,428 tons-NOx/year (88.5%), and savings from residential air conditioner retrofits are 55 tons-NOx/year (0.1%). The total annual NOx emissions reduction from all programs is 51,321 tons-NOx/year.

In 2017, the OSP NOx emissions reduction from code-compliant residential and commercial construction is calculated to be 2.89 tons-NOx/day (3.9%), savings from the PUC’s Senate Bill 7 programs will be 3.75 tons-NOx/day (5.1%), savings from SECO’s Senate Bill 5 program will be 1.45 tons-NOx/day (2.0%), electricity savings from green power purchases (wind) will be 65.32 tons-NOx/day (88.4%), and savings from residential air conditioner retrofits will be 0.52 tons-NOx/day (0.7%). The total OSD NOx emissions reduction from all programs will be 73.93 tons-NOx/day.

By 2022, the OSP NOx emissions reduction from code-compliant residential and commercial construction is calculated to be 7.57 tons-NOx/day (6.6%), savings from the PUC’s Senate Bill 7 programs will be 5.19 tons-NOx/day (4.5%), savings from SECO’s Senate Bill 5 program will be 3.61 tons-NOx/day (3.1%), electricity savings from green power purchases (wind) will be 98.22 tons-NOx/day (85.4%), and savings from residential air conditioner retrofits will be 0.40 tons-NOx/day (0.4%). The total OSP NOx emissions reduction from all programs will be 114.99 tons-NOx/day.

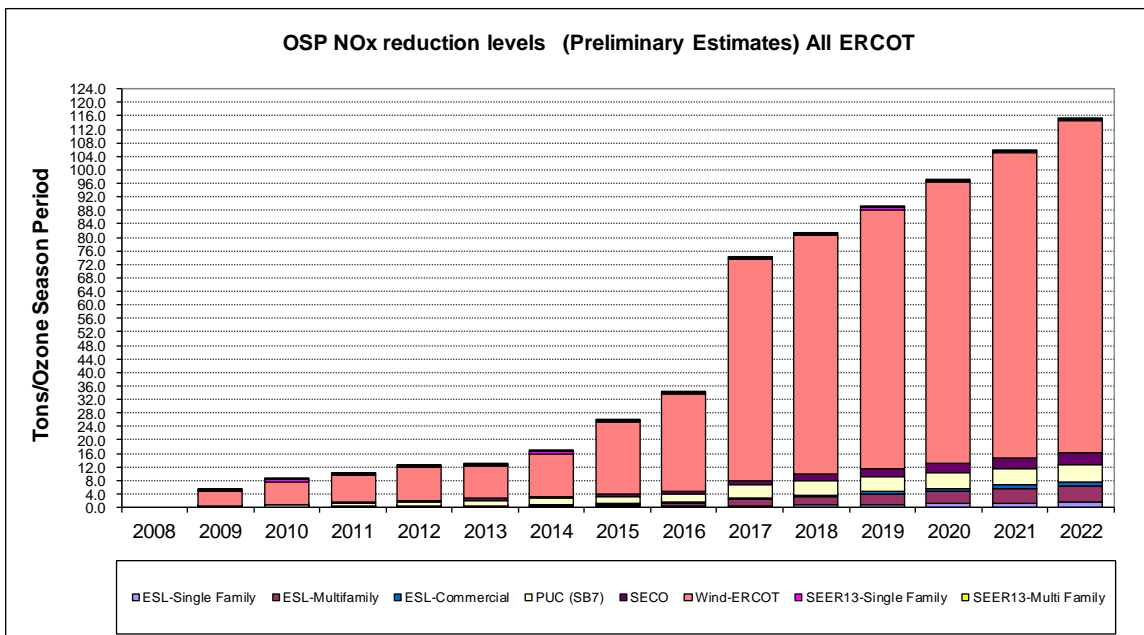


Figure 1: Integrated OSP NOx Emissions Reduction Projections through 2022 (Base Year 2008)

#### 1.4 Technology Transfer

The Laboratory, along with the TCEQ, is host to the annual Clean Air Through Energy Efficiency (CATEE) – Texas Energy Summit conference, which is attended by top experts and policy makers in Texas and from around the country. At the conference the latest educational programs and technology are presented and discussed, including efforts by the Laboratory, and others, to reduce air pollution in Texas through energy efficiency and renewable energy. These efforts have produced significant success in bringing EE/RE closer to US EPA acceptance in the Texas SIP. The Laboratory will continue to provide superior technology to the State of Texas through such efforts with the TCEQ and the US EPA.

To accelerate the transfer of technology developed as part of the TERP, the Laboratory has also made presentations at national, state and local meetings and conferences, which include the publications of peer-reviewed papers. The Laboratory will continue to provide technical assistance to the TCEQ, counties and communities working toward obtaining full SIP credit for the energy efficiency and renewable energy projects that are lowering emissions and improving the air quality for all Texans.

These efforts have been recognized nationally by the US EPA. In 2007, the Laboratory was awarded a National Center of Excellence on Displaced Emissions Reduction (CEDER) by the US EPA so that these accomplishments could be rapidly disseminated to other states for their use. The benefits of CEDER include: reducing the financial, technical, and administrative costs of determining the emissions reduction from EE/RE measures; continuing to accelerate implementation of EE/RE strategies as a viable clean air effort in Texas and other states; helping other states better identify and prioritize cost-effective clean air strategies from EE/RE; and communicating the results of quantification efforts through case-studies and a clearinghouse of information.

The Laboratory will continue to provide technical assistance to the TCEQ, counties and communities working toward obtaining full SIP credit for the energy efficiency and renewable energy projects that are lowering emissions and improving the air quality for all Texans.

If any questions arise, please contact us by phone at (979) 845-9213.

## ACKNOWLEDGEMENTS

This work has been completed as a fulfillment of Sections 386.205, 386.252, 388.006, and 388.003 (e) of the Texas Health and Safety Code and Sections 39.9051 (g) (h), and 39.9052 (c) (d) of the Texas Utilities Code, which require the Laboratory to assist TCEQ in quantifying emissions reductions credits from energy efficiency and renewable energy programs.

The authors are also grateful for the timely input provided by the following individuals, and agencies: US EPA, for providing the eGRID database and Vincent Meiller and Robert Gifford, TCEQ.

Likewise the authors appreciate the contributions of Mr. Sungkyun Jung, Mr. Farshad Kheiri, and Mr. Chul Kim to this report.

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## 2 CODE AND PRE-CODE SIMULATION RESULTS BY COUNTY

This appendix to the Laboratory's 2017 annual report contains the simulation results for single-family and multi-family residences in the 42 counties. For each county, code and pre-code simulation, and annual results for individual residence are provided (Single-family and Multi-family).

For each county, pre-code and code simulation, and annual results, for 2008 base year, for individual Single-family and Multi-family residences can be viewed using the links provided in Table 2. For counties other than 42 non-attainment and affected counties, simulations were performed for one representative county per climate zone. The annual savings for each county were calculated using the simulation results for the representative county for the same climate zone and number of houses.

Table 1: List of Counties

	<b>County</b>	<b>Climate Zone</b>
	Bastrop	2
	Bexar	2
	Brazoria	2
	Caldwell	2
	Chambers	2
	Collin	3
	Comal	2
	Dallas	3
	Denton	3
	El Paso	3
	Ellis	3
	Fort Bend	2
	Galveston	2
	Gregg	3
	Guadalupe	2
	Hardin	2
	Harris	2
	Harrison	3
	Hays	2
	Henderson	3
Nonattainment and Affected Counties	Hood	3
	Hunt	3
	Jefferson	2
	Johnson	3
	Kaufman	3
	Liberty	2
	Montgomery	2
	Nueces	2
	Orange	2
	Parker	3
	Rockwall	3
	Rusk	3
	San Patricio	2
	Smith	3
	Tarrant	3
	Travis	2
	Upshur	3
	Victoria	2
	Waller	2
	Williamson	2
	Wilson	2
	Wise	3

Table 2: Simulation Results for Individual Single Family and Multi Family Residences for All Counties.

Non-attainment or Affected Counties	2008		
	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
BASTROP	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
BEXAR	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
CALDWELL	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
COMAL	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
GREGG	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
GUADALUPE	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
HARRISON	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
HAYS	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
NUECES	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
RUSK	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
SAN PATRICIO	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
SMITH	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
TRAVIS	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
UPSHUR	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
VICTORIA	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
WILLIAMSON	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
WILSON	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
BRAZORIA	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
CHAMBERS	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
COLLIN	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
DALLAS	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
DENTON	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
EL PASO	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
ELLIS	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
FORT BEND	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
GALVESTON	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
HARRIS	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
JOHNSON	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
KAUFMAN	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
LIBERTY	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
MONTGOMERY	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
PARKER	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
ROCKWALL	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
TARRANT	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
WALLER	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
WISE	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>

ERCOT Counties (*Representative counties)		2008	
* COLEMAN	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
CALLAHAN		<u>Single Family</u>	<u>Multifamily</u>
EASTLAND		<u>Single Family</u>	<u>Multifamily</u>
ERATH		<u>Single Family</u>	<u>Multifamily</u>
FISHER		<u>Single Family</u>	<u>Multifamily</u>
HASKELL		<u>Single Family</u>	<u>Multifamily</u>
JACK		<u>Single Family</u>	<u>Multifamily</u>
JONES		<u>Single Family</u>	<u>Multifamily</u>
MITCHELL	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
NOLAN		<u>Single Family</u>	<u>Multifamily</u>
PALO PINTO		<u>Single Family</u>	<u>Multifamily</u>
SHACKELFORD		<u>Single Family</u>	<u>Multifamily</u>
STEPHENS		<u>Single Family</u>	<u>Multifamily</u>
* TAYLOR		<u>Single Family</u>	<u>Multifamily</u>
THROCKMORTON		<u>Single Family</u>	<u>Multifamily</u>
YOUNG		<u>Single Family</u>	<u>Multifamily</u>
* LEON	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
* BELL		<u>Single Family</u>	<u>Multifamily</u>
BOSQUE		<u>Single Family</u>	<u>Multifamily</u>
BROWN		<u>Single Family</u>	<u>Multifamily</u>
COMANCHE		<u>Single Family</u>	<u>Multifamily</u>
CORYELL		<u>Single Family</u>	<u>Multifamily</u>
FALLS		<u>Single Family</u>	<u>Multifamily</u>
FREESTONE		<u>Single Family</u>	<u>Multifamily</u>
HAMILTON	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
HILL		<u>Single Family</u>	<u>Multifamily</u>
LAMPASAS		<u>Single Family</u>	<u>Multifamily</u>
LIMESTONE		<u>Single Family</u>	<u>Multifamily</u>
MCLENNAN		<u>Single Family</u>	<u>Multifamily</u>
MILLS		<u>Single Family</u>	<u>Multifamily</u>
NAVARRO		<u>Single Family</u>	<u>Multifamily</u>
BRISCOE	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
* HALL		<u>Single Family</u>	<u>Multifamily</u>
* BASTROP	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
CALDWELL		<u>Single Family</u>	<u>Multifamily</u>
LEE		<u>Single Family</u>	<u>Multifamily</u>
BLANCO		<u>Single Family</u>	<u>Multifamily</u>
BURNET		<u>Single Family</u>	<u>Multifamily</u>
GILLESPIE		<u>Single Family</u>	<u>Multifamily</u>
KERR	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
REAL		<u>Single Family</u>	<u>Multifamily</u>
HAYS		<u>Single Family</u>	<u>Multifamily</u>
LLANO		<u>Single Family</u>	<u>Multifamily</u>

ERCOT Counties (*Representative counties)		2008	
MASON		<u>Single Family</u>	<u>Multifamily</u>
SAN SABA		<u>Single Family</u>	<u>Multifamily</u>
* TRAVIS		<u>Single Family</u>	<u>Multifamily</u>
WILLIAMSON		<u>Single Family</u>	<u>Multifamily</u>
* CHAMBERS	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
BROOKS		<u>Single Family</u>	<u>Multifamily</u>
CAMERON		<u>Single Family</u>	<u>Multifamily</u>
* HIDALGO	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
KENEDY		<u>Single Family</u>	<u>Multifamily</u>
STARR		<u>Single Family</u>	<u>Multifamily</u>
WILLACY		<u>Single Family</u>	<u>Multifamily</u>
JIM HOGG		<u>Single Family</u>	<u>Multifamily</u>
* ZAPATA	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
* KLEBERG	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
ARANSAS		<u>Single Family</u>	<u>Multifamily</u>
* NUECES		<u>Single Family</u>	<u>Multifamily</u>
DUVAL		<u>Single Family</u>	<u>Multifamily</u>
JIM WELLS	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
LIVE OAK		<u>Single Family</u>	<u>Multifamily</u>
SAN PATRICIO		<u>Single Family</u>	<u>Multifamily</u>
DIMITT		<u>Single Family</u>	<u>Multifamily</u>
LA SALLE		<u>Single Family</u>	<u>Multifamily</u>
MAVERICK		<u>Single Family</u>	<u>Multifamily</u>
MCMULLEN	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
* WEBB		<u>Single Family</u>	<u>Multifamily</u>
ZAVALA		<u>Single Family</u>	<u>Multifamily</u>
HENDERSON	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
* SMITH		<u>Single Family</u>	<u>Multifamily</u>
* DALLAS		<u>Single Family</u>	<u>Multifamily</u>
ELLIS		<u>Single Family</u>	<u>Multifamily</u>
HOOD		<u>Single Family</u>	<u>Multifamily</u>
JOHNSON	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
SOMERVELL		<u>Single Family</u>	<u>Multifamily</u>
TARRANT		<u>Single Family</u>	<u>Multifamily</u>
LAMAR		<u>Single Family</u>	<u>Multifamily</u>
RED RIVER	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
* TITUS		<u>Single Family</u>	<u>Multifamily</u>
* COLLIN		<u>Single Family</u>	<u>Multifamily</u>
DELTA		<u>Single Family</u>	<u>Multifamily</u>
DENTON		<u>Single Family</u>	<u>Multifamily</u>
FRANKLIN	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
HOPKINS		<u>Single Family</u>	<u>Multifamily</u>
KAUFMAN		<u>Single Family</u>	<u>Multifamily</u>
PARKER		<u>Single Family</u>	<u>Multifamily</u>

ERCOT Counties (*Representative counties)		2008	
	RAINS		<u>Single Family</u> <u>Multifamily</u>
	ROCKWALL		<u>Single Family</u> <u>Multifamily</u>
	VAN ZANDT		<u>Single Family</u> <u>Multifamily</u>
	WISE		<u>Single Family</u> <u>Multifamily</u>
	CULBERSON	<u>Summary</u>	<u>Single Family</u> <u>Multifamily</u>
*	HUDSPETH		<u>Single Family</u> <u>Multifamily</u>
	ANDERSON	<u>Summary</u>	<u>Single Family</u> <u>Multifamily</u>
	ANGELINA		<u>Single Family</u> <u>Multifamily</u>
	CHEROKEE		<u>Single Family</u> <u>Multifamily</u>
	HOUSTON		<u>Single Family</u> <u>Multifamily</u>
	NACOGDOCHES		<u>Single Family</u> <u>Multifamily</u>
*	RUSK		<u>Single Family</u> <u>Multifamily</u>
	BRAZORIA	<u>Summary</u>	<u>Single Family</u> <u>Multifamily</u>
*	GALVESTON		<u>Single Family</u> <u>Multifamily</u>
	AUSTIN	<u>Summary</u>	<u>Single Family</u> <u>Multifamily</u>
	BRAZOS		<u>Single Family</u> <u>Multifamily</u>
	BURLESON		<u>Single Family</u> <u>Multifamily</u>
	COLORADO		<u>Single Family</u> <u>Multifamily</u>
	FAYETTE		<u>Single Family</u> <u>Multifamily</u>
	FORT BEND		<u>Single Family</u> <u>Multifamily</u>
	GRIMES		<u>Single Family</u> <u>Multifamily</u>
*	HARRIS		<u>Single Family</u> <u>Multifamily</u>
	MADISON		<u>Single Family</u> <u>Multifamily</u>
	MONTGOMERY		<u>Single Family</u> <u>Multifamily</u>
	ROBERTSON		<u>Single Family</u> <u>Multifamily</u>
	WALLER		<u>Single Family</u> <u>Multifamily</u>
	WASHINGTON		<u>Single Family</u> <u>Multifamily</u>
*	MILAM		<u>Summary</u>
	BORDEN	<u>Summary</u>	<u>Single Family</u> <u>Multifamily</u>
	CHILDRESS		<u>Single Family</u> <u>Multifamily</u>
	CROSBY		<u>Single Family</u> <u>Multifamily</u>
	DAWSON		<u>Single Family</u> <u>Multifamily</u>
	DICKENS		<u>Single Family</u> <u>Multifamily</u>
	KENT		<u>Single Family</u> <u>Multifamily</u>
	KING		<u>Single Family</u> <u>Multifamily</u>
	MOTLEY		<u>Single Family</u> <u>Multifamily</u>
*	SCURRY	<u>Single Family</u> <u>Multifamily</u>	
	STONEWALL	<u>Summary</u>	<u>Single Family</u> <u>Multifamily</u>
*	CRANE		<u>Single Family</u> <u>Multifamily</u>
	REAGAN		<u>Single Family</u> <u>Multifamily</u>
	UPTON	<u>Summary</u>	<u>Single Family</u> <u>Multifamily</u>
	ANDREWS		<u>Single Family</u> <u>Multifamily</u>
*	ECTOR		<u>Single Family</u> <u>Multifamily</u>
	GLASSCOCK		<u>Single Family</u> <u>Multifamily</u>

ERCOT Counties (*Representative counties)		2008	
HOWARD		<u>Single Family</u>	<u>Multifamily</u>
JEFF DAVIS		<u>Single Family</u>	<u>Multifamily</u>
LOVING		<u>Single Family</u>	<u>Multifamily</u>
MARTIN		<u>Single Family</u>	<u>Multifamily</u>
MIDLAND		<u>Single Family</u>	<u>Multifamily</u>
REEVES		<u>Single Family</u>	<u>Multifamily</u>
WARD		<u>Single Family</u>	<u>Multifamily</u>
WINKLER		<u>Single Family</u>	<u>Multifamily</u>
* ATASCOSA	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
FRIO		<u>Single Family</u>	<u>Multifamily</u>
* BEXAR		<u>Single Family</u>	<u>Multifamily</u>
COMAL		<u>Single Family</u>	<u>Multifamily</u>
GONZALES		<u>Single Family</u>	<u>Multifamily</u>
GUADALUPE		<u>Single Family</u>	<u>Multifamily</u>
KINNEY	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
MEDINA		<u>Single Family</u>	<u>Multifamily</u>
UVALDE		<u>Single Family</u>	<u>Multifamily</u>
VAL VERDE		<u>Single Family</u>	<u>Multifamily</u>
WILSON		<u>Single Family</u>	<u>Multifamily</u>
BANDERA	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
* KENDALL		<u>Single Family</u>	<u>Multifamily</u>
BREWSTER		<u>Single Family</u>	<u>Multifamily</u>
EDWARDS		<u>Single Family</u>	<u>Multifamily</u>
KIMBLE		<u>Single Family</u>	<u>Multifamily</u>
PECOS		<u>Single Family</u>	<u>Multifamily</u>
PRESIDIO		<u>Single Family</u>	<u>Multifamily</u>
SUTTON		<u>Single Family</u>	<u>Multifamily</u>
TERRELL		<u>Single Family</u>	<u>Multifamily</u>
CONCHO	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
CROCKETT		<u>Single Family</u>	<u>Multifamily</u>
IRION		<u>Single Family</u>	<u>Multifamily</u>
MCCULLOCH		<u>Single Family</u>	<u>Multifamily</u>
MENARD		<u>Single Family</u>	<u>Multifamily</u>
RUNNELS		<u>Single Family</u>	<u>Multifamily</u>
SCHLEICHER		<u>Single Family</u>	<u>Multifamily</u>
* TOM GREEN		<u>Single Family</u>	<u>Multifamily</u>
* COKE	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
STERLING		<u>Single Family</u>	<u>Multifamily</u>
COOKE		<u>Single Family</u>	<u>Multifamily</u>
FANNIN		<u>Single Family</u>	<u>Multifamily</u>
GRAYSON	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
* HUNT		<u>Single Family</u>	<u>Multifamily</u>
MONTAGUE		<u>Single Family</u>	<u>Multifamily</u>
ARCHER	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>



ERCOT Counties (*Representative counties)		2008	
BAYLOR		<u>Single Family</u>	<u>Multifamily</u>
CLAY		<u>Single Family</u>	<u>Multifamily</u>
COTTLE		<u>Single Family</u>	<u>Multifamily</u>
FOARD		<u>Single Family</u>	<u>Multifamily</u>
HARDEMAN		<u>Single Family</u>	<u>Multifamily</u>
KNOX		<u>Single Family</u>	<u>Multifamily</u>
* WICHITA		<u>Single Family</u>	<u>Multifamily</u>
WILBARGER		<u>Single Family</u>	<u>Multifamily</u>
BEE		<u>Single Family</u>	<u>Multifamily</u>
CALHOUN		<u>Single Family</u>	<u>Multifamily</u>
GOLIAD		<u>Single Family</u>	<u>Multifamily</u>
JACKSON		<u>Single Family</u>	<u>Multifamily</u>
MATAGORDA	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
REFUGIO		<u>Single Family</u>	<u>Multifamily</u>
* VICTORIA		<u>Single Family</u>	<u>Multifamily</u>
WHARTON		<u>Single Family</u>	<u>Multifamily</u>
DE WITT		<u>Single Family</u>	<u>Multifamily</u>
* KARNES	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>
* LAVACA	<u>Summary</u>	<u>Single Family</u>	<u>Multifamily</u>