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Mr. Chairman and members of the Senate Natural Resources Committee, thank you for the opportunity to present highlights of the activities performed by Energy Systems Laboratory of the Texas Engineering Experiment Station, which is part of the Texas A&M University System. My name is Charles Culp, Associate Director of the Energy Systems Laboratory and I am joined today by Bahman Yazdani, Associate Director of the Energy Systems Laboratory.

First, let us congratulate you and your committee on taking a major step toward securing our children's and the citizens of Texas' future by tackling the issues imbedded in Senate Bill 5. As we look to the future, Texas has numerous challenges to address as we improve our air quality and energy efficiency. These will often require difficult trade-offs. Your efforts to begin addressing these in an open and cooperative manner can only help Texas remain the economic powerhouse that it is today.

Texas is blessed with an excellent economy. The growth in many of our communities ranks in the highest levels in the nation. In 2001, over 100,000 new homes were being constructed in Texas. Approximately 80% of these were in non-attainment or affected counties. Assuming a sell price of \$100,000, this represents \$10 Billion in direct annual economic activity for the State of Texas. The additional economic benefits due to this residential building in Texas are obviously higher than just the residential impact.

The Energy Systems Laboratory has a unique role in assisting the State of Texas to obtain emission credits from energy conservation and assisting code officials and builders to understand the requirements of the codes so that these codes can be successfully implemented. Being part of both the Texas A&M University System and the Texas Engineering Experiment Station allows us to tap on highly-skilled technical people in a variety of areas. The Energy Systems Laboratory or the "Laboratory," has strong ties to the Texas A&M Departments of Mechanical Engineering, Architecture, Construction Sciences, and Electrical Engineering, and can bring in other departments as specific expertise is needed.

A key focus for the Laboratory is determining the impact of technology code changes to energy efficiency in buildings and assisting in technology transfer to the public. A second and complementary focus for the Laboratory is on developing and applying new energy efficient technologies, again, with the intent of transferring this technology to the public domain. As the built environment is becoming more energy efficient, indoor air quality is also becoming a focus. We are extending our technology involvement into indoor air quality by beginning to explore complementary research efforts with the Texas A&M Medical School.

Senate Bill 5 has begun a set of actions that will benefit all Texans. Many sectors of Texas industry and the general public need help in understanding the impact of these new codes and how to make cost-effective trade-offs as purchasing and building decisions are made. Specifically, builders need help on how to successfully build cost effective housing and meet the requirements of the codes. Code officials are now looking at the base codes and trying to understand how they can raise energy efficiency and reduce emissions by enhancing code requirements to attain additional emissions reduction credits from the EPA for their communities. Also, manufacturers of building components (particularly windows and insulation) need to understand the specific details of what will be needed so they can tool up to supply these new energy efficient components. Last, but not least, the home purchaser needs assistance on how to analyze the various claims and requirements that they face when making the single most important economic decision of their lives -- the purchase of their home.

The Laboratory must increase staff to accomplish the requirements of Senate Bill 5. One of the initial steps we took was to pull together the interested stakeholders from industry, government, university and public interest organizations to

focus on prioritizing our efforts to assist in implementing Senate Bill 5. One output of this meeting was the immediate need for a Builders Guide. The stakeholders gave this a high priority. The Laboratory worked in collaboration with industry. This guide will be a real help for assisting code officials and builders. Another area that rose as a high priority was to better understand the legislative intent and make recommendations to assist manufacturers implement this intent. We worked with your committee and the Builders Association to make a technical recommendation and to help more clearly understand the timing of the legislation.

#### Specific Laboratory Accomplishments and Duties under Senate Bill 5:

As part of Chapter 386, Section 205, we are evaluating and will report on the success of the State Energy Efficiency Programs. The progress to date is that numerous meetings have been held with the PUC and TNRCC to detail the specific data that will be needed to adequately determine the savings and the resulting emissions reductions from these programs. Considerable effort remains. The data protocols definition needs to be finalized and agreed to by all interested parties, including the EPA. We will then need to analyze the data and generate a report for the PUC and TNRCC on a yearly basis.

Assisting with the adoption of building energy efficiency standards (Chapter 386, Section 003) has major ramifications to the success of this bill. Substantial effort is required to meet the legislative requirements in this section. The Laboratory is currently developing a methodology to be used to quantify local code amendments. We need to determine if the proposed amendments are substantially equal to or less stringent than the amended code. Although we have responded to many requests, NCTCOG, AACOG and several communities have asked and are waiting for evaluations of the impact of their code amendments. In addition, the Laboratory will recommend climatic modifications for a county or group of counties to help establish uniform requirements throughout a region, as appropriate. This also includes expanding assistance to counties and municipalities in non-attainment, affected and other counties in Texas. We will work with the TNRCC and EPA to quantify energy savings resulting from the adoption of the code. Our annual report will quantify these energy savings and identify municipalities and counties whose codes are more stringent, equally stringent, or less stringent than the unamended code.

We will also assist code officials in their enforcement of these codes by designing and distributing simplified materials for builders to use in showing compliance as specified in Chapter 386, Section 004. A Version of the Builders Compliance Form for use outside of municipalities is being developed. The basic requirements are defined and we are beginning the review cycle. Again, we are working in conjunction with Texas industry on building this form to assure a high acceptance. The form will be initially distributed in printed format. In the near future, this form will be available on the Internet.

The distribution of information and technical assistance (Chapter 388, Section 007), [this doesn't fit]. The Laboratory is conducting training sessions and directly assisting communities. The Laboratory will coordinate with all interested parties to make every attempt to insure that timely information is available. As previously mentioned, a stakeholders meeting was held. These meetings will be continued on a regular basis. The next meeting is being planned for the January time frame. A Builders Guide that simplifies the prescriptive requirements to meet the International Residential Code and the International Energy Conservation Code is being prepared for distribution. This was completed in conjunction with Texas industry. Six (6) training sessions have been conducted since September 1, 2001. The training effort is just starting, as over one-hundred (100) sessions per year are needed to adequately cover the key areas and groups. In addition to the initial training sessions, follow-up sessions and technical assistance will be delivered on an as needed basis. Our highest priority will be conducting training in non-attainment and affected areas. The Laboratory will also need to provide direct assistance to counties and municipalities to determine code compliance. We have received inquiries from municipalities, Councils of Government, manufacturers and other groups and companies interested in Senate Bill 5.

Our final set of challenges is in the development of Home Energy Ratings Software (HERS) section (Chapter 388, Section 008). A HERS software review is underway. This is a demanding task in that many of the equations are not readily available and, therefore, verification of performance becomes difficult. We are currently working with vendors to understand their assumptions made in their calculations. This task is to be completed by 9/1/02. Other planned tasks include generating a standard format for the HERS application in Texas and holding public information programs, which will have "town meeting" presentation formats. We also plan to WEB enable this material. The intent is to initially reach out to builders and code officials and then to assist homeowners, as they make one of the most important financial decisions of their life – the purchase of a home. There is much to be accomplished as we look forward to being a

resource to the State of Texas in helping to implement Senate Bill 5.

Conclusion:

With that, we will conclude our overview remarks on the Laboratory's efforts for Senate Bill 5. We would be happy to respond to questions. Thank you again for your efforts to address the needs of the citizens of Texas and our environment.