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SUSTAINABLE ENERGY STUDY #10

New Study Shows How Texas Can Meet Future Energy Needs with Energy Efficiency and Onsite Renewables:

A new study released on March 6, 2007 shows that a combination of energy efficiency and onsite renewable energy resources, coupled with expanded demand response programs, can meet Texas' growing electricity needs and save consumers money at the same time.

The study was commissioned by Environmental Defense and conducted by researchers at the American Council for an Energy-Efficient Economy (ACEEE) in Washington, D.C., based on ACEEE research with support from Texas experts.

The study outlines nine policies to moderate electricity demand through energy efficiency and develop onsite renewable energy resources such as solar and biomass. The expanded efficiency policies would meet 17.5 percent of forecasted 2023 electricity demand, while the onsite renewable policies would displace future conventionally generated electricity by an additional 4.9 percent for a total reduction of 22.4 percent, meeting the projected increases in demand over the next 15 years.

Combined with demand response and renewables, efficiency offers Texas a sustainable energy future that provides greater energy security, costs less, pollutes less, and supports economic growth better than the state's current course.

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Potential for Energy Efficiency, Demand Response, and Onsite Renewable Energy to Meet Texas's Growing Electricity Needs

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Executive Summary

In the immediate and long-term future, energy efficiency, demand response, and onsite renewable energy resources can meet the growing demand for electricity in Texas. Efficiency and renewable energy resources, combined with a significantly expanded demand response, can

meet 107 percent of the projected growth in summer peak demand by 2013, heading off the reserve margin crisis that is forecast for the state and actually reducing the overall summer peak demand in key years. These goals can be accomplished at a lower cost than by constructing new conventional generation resources, thus enhancing the energy security and sustaining the state's economic growth.

The Energy Challenge for Texas

The state of Texas is rapidly growing, with the state's population growing at a rate of 1.8 percent per year and the economy expanding at an annual rate of 3.8 percent from 2000 to 2006. It is projected that population growth will continue at a rate of 1.7 percent per year through 2023 (the horizon for this study), with the state's economy projected to grow at 3.2 percent per year.

The most pressing short-term policy concern in Texas is the rapid growth in peak demand. The state's peak electricity demand—which occurs, for example, when consumers crank up air conditioners during extreme heat—is growing faster than the state's population. State energy leaders are concerned about whether the state will have sufficient generation to meet peak demand by 2009.

The Electric Reliability Council of Texas (ERCOT) reports that peak demand on the ERCOT system increased by about 2.5 percent per year between 1990 and 2006. The current forecast is for peak demand to increase by 2.3 percent annually from 2007 through 2012. ERCOT has raised the prospect that the state might be without sufficient generation capacity to meet peak demands as soon as 2009, creating images of a power crisis similar to that experienced in 2000 and 2001 in California.

The state's rapidly growing peak electric demand and electricity consumption have led ERCOT and utilities to suggest that Texas should take actions to change the mix of electric generating resources and lean heavily on building new coal-fired power plants. We suggest that demand-side and renewable resources, beyond conventional supply resources, should be considered as the state develops its near- and long-term energy plans. This report characterizes the potential for these key "alternative" resources and recommends policies to bring them on-line at the needed rate.

Energy Efficiency, Demand Response, and Onsite Renewable Resources

Texas has already taken progressive steps in the area of clean energy through its renewable energy portfolio (RPS) and its energy efficiency improvement programs (EEIP), which direct transmission and distribution utilities to serve 10 percent of load growth through energy efficiency. The utilities have easily met the efficiency target, and Texas already gets more than 4 percent of its electricity from wind, so the state is on track to exceed the levels in the RPS.

However, there is much more that can be achieved from energy efficiency and renewable energy resources. In particular, the level of savings that utilities can achieve through the EEIP can be greatly and cost-effectively increased. In addition, the EEIP does not apply to cooperative and municipal utilities in the state. While some of these utilities are already active in this area, all

should contribute to meeting the state's needs. In addition to the EEIP, there are several other policies that could provide more energy efficiency resources.

The potential for onsite renewable energy generation (including solar photovoltaic generation systems) is very large in Texas. This report estimates the size of the energy efficiency and onsite renewable energy resources in Texas, and suggests a suite of policy options that the state can consider to realize their achievable potential.

In addition, a significant opportunity also exists to expand the state's "demand response" resources to reduce system peaks, as has been recommended by ERCOT. If initiated soon and pursued aggressively, the combined deployment of demand response and the other clean energy resources described above can address the state's reserve margin concerns while ensuring that the state has adequate, affordable electricity to sustain its economic growth. This report explores the opportunities in Texas for additional energy efficiency, demand response, and onsite renewable energy, and outlines the policies and programs necessary to harness these resources to meet the state's future energy needs.

Policy Recommendations

The study recommends nine policies as building blocks for this new energy future that are both effective and potentially politically viable in Texas:

- * Expand Texas's existing Energy Efficiency Improvement Program (EEIP) from the current 10 percent of load growth to 50 percent of load growth
- * Set new state-level appliance and equipment standards
- * Establish more Stringent Building Energy Codes
- * Develop advanced energy-efficient building program
- * Implement energy-efficient state and municipal buildings program
- * Implement short-term public education and rate incentives
- * Increase demand response programs that can reduce electricity demand during peak load periods
- * Set a target for expanded installation of combined heat and power (CHP) capacity in Texas
- * Provide incentives for expanded installation of onsite renewable energy

By implementing these clean energy resource policies, Texas can meet its summer peak demand needs without any additional coal-fired power plants or other conventional generation resources. Expanded demand response programs, combined with the demand reduction from energy efficiency investments, combined heat and power, and onsite renewables, would reduce the 2013 projected summer peak (MW) by 12 percent and the 2023 peak by 33 percent.

In addition to their peak demand capacities, these combined policies would meet 8 percent of Texas's electricity consumption in 2013 and 22 percent in 2023. The most significant energy efficiency recommendations are for improved Combined Heat and Power (CHP) policies and a Utility-Sector Energy Efficiency Program. In the report's recommendations, an Energy Efficiency Improvement Program (a utility savings target similar to the Renewable Portfolio Standard concept) and improved policies to expand CHP would each produce about 30 percent

of the total savings. Creating incentives for building owners to invest in solar and other onsite renewable energy would produce 22 percent of the total savings. Improved building codes, appliance standards, and public building efficiency initiatives would meet 13 percent of the 2023 electricity usage, and are important due to the rapid growth of electricity usage in buildings.

These policies have proven effective and economic in other states when compared with conventional resource options, and would establish a foundation upon which the state could build a sustainable energy future, while bolstering the state's economic health. There are certainly other policy options available, but those described in this report appear to be the most appropriate for Texas given its history and opportunities.

The clean energy policies analyzed in this report will spur investments in energy efficiency and renewable energy, resulting in utility bill savings of \$73 billion or more over the next 15 years for the consumers who make these investments, while helping to moderate electricity prices for all consumers. The suite of policies we recommend has a levelized energy cost of 4.5 cents per kilowatt-hour, including capital investment in clean energy technology and administrative costs. This compares favorably with a current average retail electric price of 9.1 cents per kilowatt-hour.

The total cost of implementing all of these programs (incentives plus program and administrative costs) averages about \$800 million per year. These public investments leverage much larger total investment by consumers (four-fold higher). While these public investments will be borne in most cases by Texas's electric consumers in the form of a public benefits charge, their net impact will reduce future electricity costs for all consumers.

Importance of the Clean Energy Path for Texas's Energy Future

Policy action to adopt the energy efficiency and renewable energy policies described in this report would set Texas on a course to avoid near- and long-term electricity supply crises, while helping to stabilize energy prices. Efficiency and onsite renewables, when combined with expanded demand response programs, can also resolve concerns about meeting peak summer demands in the next few years, thus answering the question of where the state will get the electricity it needs to sustain its growing economy. While no single policy solution will address the state's longer-term energy challenges, the portfolio of policies proposed in this report will go a long way toward meeting Texas's future energy needs while ensuring its continued economic health.

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The report, "Potential for Energy Efficiency, Demand Response, and Onsite Renewable Energy to Meet Texas's Growing Electricity Demands," is available for free download at <http://aceee.org/pubs/e073.htm>.

A hard copy of the 115-page report can be purchased for \$50 plus \$5 postage and handling from ACEEE Publications, 1001 Connecticut Avenue, N.W., Suite 801, Washington, D.C. 20036-5525, phone: 202-429-0063, fax: 202-429-0193, e-mail: aceee_publications@aceee.org.

You may view the full report as a PDF at:

<http://aceee.org/pubs/e073.pdf?CFID=2562472&CFTOKEN=24143150>

See the ACEEE news release about this report at <http://www.aceee.org/press/e073pr.htm>

This report will be followed by a second study that will assess the economic impacts of these investments in energy efficiency and renewable energy resources. A previous analysis in Texas found that these types of investments typically produce twice the jobs and in-state economic growth that are produced from an equivalent investment in power plants.