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PUCT PROJECT NO. 56517
REVIEW OF ENERGY EFFICIENCY PLANNING for the PUBLIC UTILITY COMMISSION OF TEXAS

AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY'S INITIAL COMMENTS

The American Council for an Energy-Efficient Economy (ACEEE) offers these comments in response to the Public Utility Commission of Texas's "Questions for Comment" regarding Project No. 56517 – *Review of Energy Efficiency Planning* filed on April 23, 2024.

1. **Should certain hours of the day be considered more valuable within the design of standard offer or targeted market-transformation programs offered by utilities? Please discuss your rationale in detail.**

Yes. The cost for the Texas electricity system to meet customer demand varies as a function of time. This is due to a variety of factors including the variable cost of generating, transmitting, and distributing electricity. Electricity system costs are particularly high during periods of peak demand, which sets the total amount of required resource capacity. Energy efficiency (EE) and demand response (DR) offer the greatest value when they reduce demand during high-cost hours. Time-based utilization of demand-side resources results in wholesale energy cost savings that can be passed on to customers while simultaneously enhancing the reliability and resilience of the electric grid.

Most energy efficiency measures produce energy savings that vary over the course of a year. When projected onto variable electricity system costs, a clear time-sensitive value of energy efficiency (TSV-EE) emerges. This value has been thoroughly studied and quantified by multiple groups, including our U.S. National Laboratories.[1] Lawrence Berkeley National Laboratory concludes, "Quantifying the TSV-EE is necessary to properly account for all of the costs and benefits of energy efficiency, and to identify, prioritize and implement efficiency resources that contribute to a low-cost, reliable electric system."[2]

Other factors are coalescing to make TSV-EE more important. Distributed generation, including behind-the-meter solar and storage, is growing in Texas, and varies considerably by hour and season. Electric vehicles will add significant new load to the grid. The ability to influence when these technologies charge and discharge will be important for reducing peak demand and electricity system costs. Understanding the timing of these and other more conventional grid-

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[1] See, for example: Mims, N., T. Eckman, and C. Goldman. 2017. Time-varying value of electric energy efficiency. https://emp.lbl.gov/publications/time-varying-value-electric-energy;
Boomhower, J., and Davis, L., June 2016. Do Energy Efficiency Investments Deliver at the Right Time? http://e2e.haas.berkeley.edu/pdf/workingpapers/WP023.pdf;
United States Environmental Protection Agency National Action Plan for Energy Efficiency. 2006. https://www.epa.gov/sites/production/files/2015-08/documents/napee_report.pdf

[2] Mims Frick, N. and L. Schwartz. 2019. Time-Sensitive Value of Efficiency: Use Cases in Electricity Sector Planning and Programs. https://eta-publications.lbl.gov/sites/default/files/lbnl_time_varying_programs_final.pdf

scale generation resources allows utilities and the PUCT to better determine not only the optimal amount of energy to procure, but *when* to do so.

Accounting for TSV-EE allows utilities to identify the most valuable energy savings, which in turn enables better efficiency planning and programming. It helps prioritize measures or programs that save energy during high demand periods. It also helps adjust existing program and measure incentive or rebate levels so that electricity system goals can be achieved at lowest cost. While outside the scope of this question, we note that time-sensitive valuation conveys similar benefits for distribution system planning, electricity resource planning, electricity rate design, and state and local government activities.

Texas, along with many other states, has traditionally set energy efficiency goals in terms of annual targets. The technical reference manuals (TRMs) that report the deemed savings associated with EE measures often do so in terms of annual kilowatt-hour reductions. The coarseness of goals and available data have both played a role in miring EE programs within frameworks that fail to fully account for their time-dependent benefits.

Fortunately, multiple options now exist to better understand the energy savings achieved by EE measures on an hourly (or shorter) basis. Utilities can carry out a dedicated study of customers' hourly load reductions before and after energy efficiency measures are installed. They can take a measured savings approach to individual end-uses by sub-metering or by leveraging AMI (i.e., smart meter) data and algorithms to disaggregate net load.[3] Utilities could also take advantage of publicly available end-use load profiles and savings shapes as developed by the National Renewable Energy Laboratory.[4]

The growing prevalence of distributed and variable energy resources is making the electricity system more difficult to forecast. Utilities will increasingly struggle to maintain reliability on a system with a growing number of energy resources (e.g., behind-the-meter solar+storage) that are not only outside of their control, but which they may not even know exist.

Within this context, energy efficiency stands out as perhaps the most reliable energy resource available. Unlike generation, energy efficiency is "always on", delivering savings when operational, and requiring no energy demand when not. Once deployed, energy efficiency does not need to be actively managed. It can be targeted to specific geographic locations to minimize localized grid constraints, such as overloaded distribution feeders. It can also be preferentially directed to customers at risk of nonpayment, lowering the chances of their winding up in arrears. In short, it makes the entire challenge of meeting demand with generation easier and less risky to manage.

[3] For example, utilities can use the Normalized Metered Energy Consumption (NMEC) model, which uses AMI data before and after an intervention to determine savings.

[4] https://www.nrel.gov/buildings/end-use-load-profiles.html

2. **What metrics should be used to track the success of low-income and hard-to-reach programs under 16 Texas Administrative Code (TAC) §25.181?**

There are several actions Texas can take to strengthen and track the success of low-income and hard-to-reach programs. More than a quarter of U.S. households experience a high energy burden—defined as having energy bills that exceed 6% of household income—and this share is higher for low-income customers and other historically disadvantaged and marginalized communities.[5] This is an especially vulnerable class of customer for whom realized energy savings yield elevated financial benefits that can make a meaningful difference in their lives.

Texas presently requires that at least 10% of each utility's annual EE program expenditures target low-income customers and 5% of savings achieved through EE programs come from hard-to-reach customers. While we commend the state for setting minimum requirements, the current percentages are far too low.

First, we recommend that the low-income and hard-to-reach spending/savings goals be increased to at least be proportional to these customers' share of the Texas population. According to the latest U.S. Census, over 25% of the households in counties served by Texas's three largest investor-owned utilities (i.e., AEP Texas Central, CenterPoint, Oncor) qualify as low-income, therefore **at least 25% of total EE savings should be realized by those customers**.

Alternatively, Texas could consider setting a metric in terms of low-income energy efficiency *spending*. A similar proportionality principle holds, but because it often costs more to deliver a kWh of energy savings to a low-income customer than a market-rate customer, the percentage of spending, at minimum, should be higher than the percentage of low-income customers. Low-income spending targets are simpler to administer and regulate but have the disadvantage of not being directly linked to the most important tangible outcome – energy savings.

Second, we recommend that utilities institute a program or process that **directs customers at risk of utility disconnection for nonpayment toward energy efficiency measures** that could lower their energy bills in perpetuity. Examples of actions include connecting customers who miss payments with energy efficiency program information; offering case management service for customers who miss payments, where those services include connection to energy efficiency solutions; and including energy efficiency measure solutions as part of bill assistance programs.

Third, we recommend that Texas **consider a requirement for its utilities to track their low-income customers' energy burdens**, i.e., the percentage of household income spent on energy costs. We further recommend that Texas considers **setting energy affordability targets**, e.g., that no customer has to pay more than 6% of their income in energy costs. Such a metric could have tangible, life-changing impact for the benefitted customers.

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[5] Drehobl, A., L. Ross, and R. Ayala. 2020. How High Are Household Energy Burdens? https://www.aceee.org/research-report/u2006

Each of the recommendations listed above is only possible if low-income customers are provided convenient access to programs that fit their needs. To that end, there are several steps utilities can take to ensure low-income customers are served to the best of their ability.

First, **utilities should expand their approach to conducting community engagement with low-income groups** in their service territories to inform the design or improvement of their energy efficiency programs. Including low-income customer groups in the program planning process provides authentic opportunities for engagement and feedback. Failure to engage community members during program design risks overlooking structural issues that could impede and missing insights that could enhance effective delivery of efficiency solutions.

We therefore recommend that utilities hold or attend meetings aimed at better understanding how to effectively deliver energy efficiency solutions to low-income customers. Utilities should also facilitate active representation from community members by, for example, holding meetings in accessible locations, inviting community-based organizations to participate, or offering support that incentivizes participation. Utilities should also demonstrate that they have improved their energy efficiency programs based on the input received.[6]

Part of ensuring adequate low-income program participation is making energy efficiency programs as easy to access as possible. Approximately 8.2% of the U.S. population reports not being able to speak English very well, and that percentage reaches upward of 45% in some counties (Census Bureau 2020).[7] If utility EE program information is provided primarily for an English-speaking audience, individuals unable to effectively read, write, speak, or understand English will be limited in their ability to effectively interact with and use these programs, leading to underperformance, higher bills for non-participants, and higher utility system costs all customers must bear.

We recommend that **utilities address language-related barriers to EE program participation** in two ways: instituting a process to determine which languages need to be offered in their utility territory to improve equitable access, and taking actions to actually expand that access. Achieving the former goal can be accomplished by developing a language access plan; soliciting input from customer surveys or stakeholder processes; conducting focus groups featuring public, private, and business organizations that interact with English-isolated families; or using U.S. Census data to understand the languages spoken in their service territory. The concept of a language access plan is more common in the healthcare, judicial, and government sectors than in the energy sector, but several utilities and regulatory commissions have developed them.[8]

[6] For additional details on these recommendations, see 2023 Utility Energy Efficiency Scorecard, pp. 127–131. https://www.aceee.org/research-report/u2304

[7] The lack of English-language proficiency may actually be higher than this due to the undercounting and overcounting of different populations (Khubba, Heim, and Hong 2022). https://www2.census.gov/programs-surveys/decennial/coverage-measurement/pes/national-census-coverage-estimates-by-demographic-characteristics.pdf

[8] For example, see https://www.mass.gov/doc/2018-dpu-language-access-plan/download.

Utilities can take actions that expand language access in various ways. These include running advertising campaigns with prominent non-English news outlets or with the assistance of an agency that specializes in reaching non-English populations; participating in long-form, in-language television or social media interviews on a program that serves as a prominent resource for the non-English community; or offering in-language presentations as part of community events to reach non-English customers in person.

Finally, Texas should **consider using the number of program participants as a metric to measure low-income energy efficiency program progress.** However, we caution that the definition of "participant" must be carefully selected to meet Texas's policy goals. Across the U.S., a "participant" can range from an individual who purchases an energy efficient light bulb to a multifamily building that undergoes a comprehensive energy efficiency retrofit. A no-regrets action is to clearly describe and count different types of participation, rather than grouping low-income customers in one large bucket. For example, two metrics could be used – number of low-income customers who received some services (e.g. an audit or lightbulbs) and those who received comprehensive weatherization services for their whole home or apartment.

5. **Existing 16 TAC §25.181 addresses energy savings and demand reduction goals. Should these existing goals be revised in a future energy efficiency rulemaking? If so, how? Please discuss your rationale in detail.**

Yes, Texas should increase its minimum requirements for both annual energy savings and peak demand reduction. We will detail how in the paragraphs to follow. First, we will explain why raising efficiency targets is so important specifically for Texas. Next, we will summarize a set of potential supply- and demand-side solutions. Finally, we will recommend 10 specific energy efficiency and demand response programs for Texas including information about the number of customers they can serve, their cost, and their estimated energy and summer and winter peak demand savings.

Reliability Challenges

Texas has recently experienced major electric reliability problems or close calls on multiple occasions due to a combination of extreme weather (hot or cold) and failures of its power system. Despite multiple actions by Texas state and utility officials, more change is needed to address growing power demand in the state and periodic equipment failures.

Last May, ERCOT forecasted that it would experience record peak demand in summer 2023 and that it would have adequate power availability to meet that need *unless* there was a confluence of extreme heat, widespread outages at fossil fuel plants, and low renewable energy output. Unfortunately, the convergence of events like these is highly possible.

ERCOT maintained grid reliability in 2023, but a handful of days saw very high peak loads, reaching as high as 85.4 GW on August 10. In addition to coming close to rolling blackout conditions, these peaks also led to very high wholesale energy prices. Summer 2023 was not only one of the hottest on record for Texas, but high temperatures lasted for extended periods of time. Coupled with unprecedented load growth, these climate conditions are putting tremendous pressure on the Texas grid. Grid strain has historically caused extreme volatility in wholesale energy prices, with devastating consequences to residential customers tethered to those rates.

Texas was not as fortunate during Winter Storm Uri in February 2021, when ERCOT had to cut electric service to over 4.5 million customer meters for multiple days of extremely cold weather. This event reflected the extraordinarily high demand for electric home heating (from inefficient homes and equipment) combined with the loss of 50% of the state's generation fleet (due to freezing weather, reduced fuel supply, and equipment failures). Supplies were again tight in December 2022 during Winter Storm Elliott, when low temperatures led to some gas outages. ERCOT has also faced recent summer supply challenges, as illustrated by calls for voluntary power conservation in June 2021, summer 2022, and summer 2023.

In June 2021, the shortage was driven by a large number of plants being out of service for unplanned repairs. In summer 2022, record demand nearly exceeded available generation supplies, but blackouts were averted by a mixture of operating extra plants to keep reserves high, industrial demand response, and requests for households to raise their thermostats. Together, these measures cost over $3 billion in 2022. In summer of 2023, during a long "heat dome" event, multiple new peak demand records were set, but power cutbacks were averted due to a continuation of the 2022 measures as well as substantial increases in output from Texas' renewable electricity generators. ERCOT's evolving generation resource mix is changing quickly while load is expanding rapidly, so the energy-only wholesale market design is challenged to adapt effectively.

Texas's growing population and accompanying load growth are driving increased electricity demand. Between 2018 and 2022, the state's population grew by 5%, and ERCOT peak load grew by 9%. Texas's population increased by 23% from 2008 through 2022, with little check on electric usage from energy-efficient building codes or utility efficiency programs. Moreover, ERCOT projects that peak demand will rise by more than three-quarters to 152 GW in 2030, driven by data centers, artificial intelligence, industrial electrification, and other sources. In short, peak demand growth in Texas poses a major challenge in need of all cost-effective solutions. As we will demonstrate, demand-side solutions have the potential to absorb a substantial portion of that peak.

Potential Solutions

Texas policymakers have proposed numerous supply-oriented solutions to address these problems, including winterization of existing power plants and critical grid infrastructure, subsidized construction of many new power plants, and additional financial incentives to reward dispatchable generation. To address Texas' reliability challenges, in May 2023 the Texas legislature adopted two bills. Texas Senate Bill 2627 focuses on adding new quick-start gas generation. The bill offers up to $10 billion of state funds for 3% loans for new power plants, bonuses for plants completed in the next three years, and maintenance loans to existing generators. The other bill, House Bill 1500, includes a provision directing the Public Utility Commission of Texas (PUCT) to establish a program to provide additional reliability payments to power generators. Under this program, annual net costs are capped at $1 billion per year. Details will need to be worked out by PUCT, with the program likely beginning in 2027. It is unclear how much these plans will help reliability.

Another way to improve ERCOT reliability is to manage demand as well as supply, expanding Texas utilities' currently limited energy efficiency and demand response programs, with a focus on programs that can substantially reduce summer and winter peak demand. A variety of proven and targeted EE and DR measures could be used immediately to address Texas's electric reliability and affordability challenges. Texas has some very good EE and DR programs, but they have low goals and low funding. These programs can and should be expanded to complement new power plant additions, slowing energy demand growth at lower cost than just relying on traditional supply-side solutions.

Under 16 Tex. Admin. Code §25.181 Texas has set an annual efficiency goal of "four-tenths of 1% of its summer weather-adjusted peak demand for the combined residential and commercial customers for the previous program year." In 2021, this goal led AEP Texas Central, CenterPoint, and Oncor to save 0.24%, 0.22%, and 0.20% of its energy, respectively, measured as a percentage of retail sales.

In comparison, the largest U.S. utilities[9] save an average of 0.91% through energy efficiency each year. Top-performing utilities consistently save over 1.3% each year. In short, Texas has extremely high unrealized potential to reduce customer bills, lower electricity system costs, and enhance grid reliability and resilience through EE.

For this reason, **we recommend that Texas increase the level of its energy efficiency resource standard. Currently, each year Texas utilities must save an amount of energy equal to 0.4% of its summer peak demand. We recommend that energy savings target be increased to at least the equivalent of 1% of summer-weather adjusted peak demand.** Because Texas is at risk of additional winter reliability issues, we recommend that a complementary target based on winter-weather adjusted peak demand be introduced as well. We recommend that these goals remain in place each year through at least 2030 to allow energy efficiency implementers adequate time to deploy efficiency solutions at the scale needed to address the state's various challenges.

Texas would also benefit from strengthening its peak demand reduction targets. **We recommend that Texas increase its peak demand reduction goals by at least 1% per year for both the summer and winter seasons through at least 2030**. As our research shows below, this target is but a fraction of what is feasible in Texas.

Specific EE and DR Measures to Address Texas's Reliability Challenges

Current Texas EE and DR programs direct the bulk of their efforts toward commercial and industrial customers. But since nearly half of ERCOT's summer and winter peak loads come from residential customers' weather-sensitive loads[10], and Texas investor-owned utilities deliver energy efficiency to approximately 164,000 Texas households (R. Parsons, Director of Communications, Public Utility Commission of Texas, email of Sept. 14, 2023) out of Texas' 10.2 million households[11] per year, residential electricity use is an underutilized efficiency target that can have immediate, strategic impact on peak loads. These programs could be ramped up more

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[9] This set includes the 53 largest U.S. utilities as measured by retail sales.
[10] "Summer Weather Impacts on Load by Customer Type" and "Winter Weather Impacts on Load by Customer Type" as cited in Environmental Defense Fund, Texas Consumer Association, and Alison Silverstein Consulting. 2021. "Project No. 52373 Review of Wholesale Electric Market Design." October 31.
[11] https://www.census.gov/quickfacts/fact/table/TX/PST045222. In addition to customers served by investor-owned utilities this figure includes customers served by public utilities of which the two largest are Austin Energy and CPS Energy.

quickly than power plant construction and could have significant impact on peak demand beginning in the summer of 2025.

A 2023 ACEEE research report, *Energy Efficiency and Demand-Response: Tools to Address Texas' Reliability Challenges,* finds that **a set of 10 EE and DR retrofit measures, deployed aggressively under statewide direction through 2031 could serve over 14 million Texas households and offset about 15 GW of summer peak load and 25 GW of winter peak load** (see Figure 1). The proposed set of EE and DR programs would have a total cost over the 2025–2031 period of about $9.1 billion (average of $1.3 billion per year across the entire state of Texas). These findings are for all of Texas; since ERCOT represents about 90% of Texas loads, impacts for ERCOT can be estimated by multiplying these figures by 90%. Our full research report also offers a scenario where approximately 80% of the peak demand benefits are achieved for about half the cost of the full EE and DR package.[12]

For comparison purposes, ERCOT wholesale electric costs exceeded $32.2 billion in 2022[13], and total retail electric bills were about $39.8 billion in 2021 statewide.[14] During the 2023 legislative session, the legislature considered a proposal to build 10 GW of new natural gas-fired generation at a capital cost of $18 billion[15], with additional downstream costs for generator fuel, maintenance, and transmission infrastructure.

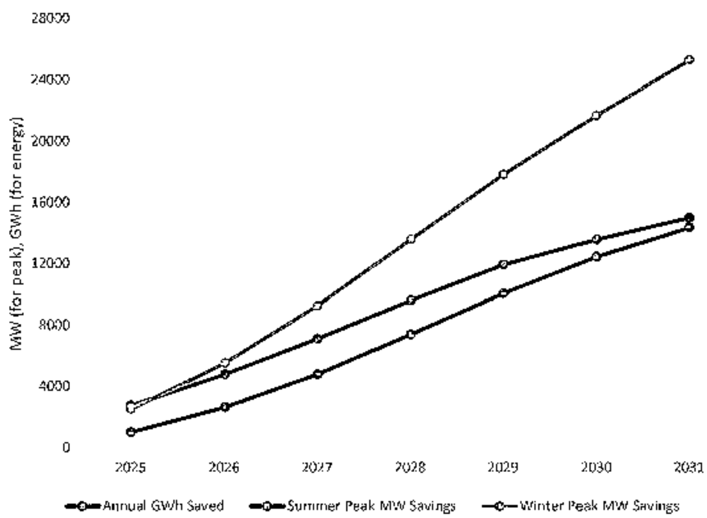

Figure 1. Cumulative annual energy and peak savings by year from the sum of the programs analyzed

[12] https://www.aceee.org/white-paper/2023/08/energy-efficiency-and-demand-response-tools-address-texas-reliability. Results were originally calculated in 2023 for the 2024–2030 time period. These results are largely independent of program start year, so for the purpose of these responses, we have shifted our results to reflect savings in the 2025–2031 time period.

[13] https://www.ercot.com/files/docs/2023/06/13/8%20Independent%20Market%20Monitor%20(IMM)%202022%20State%20of%20the%20Market%20Report%20for%20the%20ERCOT%20Electricity%20Markets.pdf

[14] https://www.eia.gov/electricity/state/texas/

[15] https://www.kut.org/energy-environment/2023-04-07/state-senate-plan-to-finance-power-plants-would-cost-8-billion-more-than-lawmakers-said

Efficiency measures, once installed, will continue delivering continuous comfort and energy bill savings for the host customers, while reducing peak load and lowering energy bills for all customers in Texas and ERCOT over the course of their 10- to 20-year measure lives. Ongoing investment in EE and DR could continue growing these customer savings benefits over time, while giving ERCOT and the PUCT time to stabilize the supply-side power market rules, infrastructure, and costs.

We recommend that Texas utilities adopt the following 10 retrofit EE and DR programs. These programs were selected for their proven capability to reduce summer or winter peak electricity demand. For additional details on each of these programs, please reference our full research report.[16]

Efficiency measures

- Program to replace electric furnaces with ENERGY STAR® heat pumps
- Attic insulation and sealing incentive program
- Heat pump water heaters incentive program
- Smart thermostat incentive program (an efficiency program that helps enable the DR program listed below)
- Set of energy efficiency programs serving low-income homeowners and renters, including low-cost kits distributed by community groups and more comprehensive whole-home retrofit programs for single-family homes and multifamily apartments
- Small commercial and industrial retrofit program
- Monitoring-based commissioning program for large commercial buildings[17]

Demand response measures

- Central air conditioner/electric heating with smart thermostat control
- Water heater timing controls
- Electric vehicle managed charging

Most of these measures can be used to reduce peak demand in both the summer and the winter. However, small commercial and industrial (C&I) saves a lot more in the summer than in the winter, and electric furnace replacement primarily reduces winter loads and peaks. **We would particularly identify two opportunities that should receive accelerated attention**:

1. Smart thermostat control for central AC and electric heating. Several Texas utilities are conducting pilot programs in 2024. If these pilots are successful, these programs should

[16] https://www.aceee.org/white-paper/2023/08/energy-efficiency-and-demand-response-tools-address-texas-reliability
[17] Monitoring-based commissioning is a process developed at Texas A&M that uses data from building energy management systems that are common in large buildings, along with some additional strategically placed sensors to help analyze and optimize building operations. Typical energy savings of about 9% can be achieved.

be rapidly scaled up as they can be an excellent way to help utilities manage extreme peaks.

2. Replacing electric furnaces with ENERGY STAR heat pumps at the time existing central air conditioners need to be replaced. The modest incremental cost for a heat pump will result in substantial energy and winter peak savings as well as moderate summer peak savings (since heat pumps sold are on average a little more efficient for cooling). New federal grant funds that the Texas Energy Conservation Office will administer can also be leveraged to help cover the incremental cost of the heat pump.

If these programs were implemented at wide scale with suitable levels of program investment beginning in 2025, by 2031 they could deliver enough summer peak savings to eliminate over 18% of Texas's all-time summer peak as of this writing (85,435 MW in August 2023). Similarly, prompt and aggressive efficiency and demand response investments starting in 2025 could reduce 2031 winter peak load by about 30% of what the peak would have been in February 2021 had power been provided to all customers without power shutoffs (estimated 78,000 MW; ERCOT's documented winter peak was 74,427 MW in 2022). These energy efficiency programs will reduce annual electricity consumption by about 15,500 million kWh of electricity by 2031, a relatively small proportion of future electric energy consumption—but these programs are intentionally designed to reduce peak summer and winter demand (MW) and not just reduce energy use (MWh). Savings by year are shown in Figure 1.

Results by program are summarized in Table 1. The largest winter peak reductions (over 10,000 MW by 2031) come from replacing electric furnaces with heat pumps. The largest summer peak reductions (about 4,300 MW by 2031) are from electric vehicle charging demand response and from central air conditioner demand response (about 4,000 MW by 2031). The attic insulation and sealing program delivers the largest energy savings (about 5,000 million kWh in 2031) while also delivering 1,900 summer peak MW and 2,400 winter peak MW in 2031. This program is also valuable because better-insulated homes are more effective for sustainable demand response and occupant comfort. This program accounts for about 40% of the total cost of the 10-program package but is foundational to make heating and cooling measures more effective. The smart thermostat and heat pump water heater programs have the best benefit-cost ratio.

In the longer term, the value of energy efficiency in Texas will depend on the state's specific mix of generation resources. In the event that Texas is eventually powered by a higher percentage of renewable energy, the most valuable EE measures are likely to be residential measures that address building envelope (i.e., insulation and air sealing), HVAC, and smart thermostats. In a high renewable energy future[18] if these measures are deployed at scale, Texas could expect to avoid over $8 billion in annual marginal costs by 2050 from these measures alone.[19]

[18] 95% renewable energy by 2050

[19] https://www.aceee.org/research-report/u2303

Table 1. Estimated cumulative seven-year costs, savings, and households served for 10 residential energy efficiency and demand response programs targeting peak demand reductions

Program	Customers served	Peak savings in 2031 (MW) Summer	Winter	Energy savings (GWh)	Costs ($million)
Efficiency					
Replace electric furnaces with Energy Star HP	947,467	86	10,154	1,281	474
Attic insulation/sealing and duct sealing	2,180,980	1,907	2,435	4,992	3,420
Smart thermostats	2,764,622	1,355	3,029	2,488	276
Heat pump water heaters	299,385	222	383	636	82
Monitoring-based commissioning	735	300	125	1,315	215
Small C&I	86,301	1,077	718	2,734	876
Low-income (sum of 3 subprograms)	2,224,912	869	1,532	2,012	1,816
Subtotal	8,504,401	5,816	18,377	15,459	$7,159
Demand Response					
Central AC/electric heat demand response	2,611,032	3,988	1,476		1063
Water heater demand response	2,224,000	904	1,130		389
EV charging demand response	750,000	4,286	4,286		525
Subtotal	5,585,032	9,178	6,892		1,977
TOTAL	14,089,433	14,994	25,269	15,459	$9,136
Add 13.75% reserve margin		17,056	28,744		

The bottom line is that the EE and DR programs examined will deliver large benefits to Texas consumers and utilities. These measures focus on residential EE retrofit measures, since Texas's large stock of old, inefficient homes is where much of the state's energy waste is occurring. Consumers will benefit from the following:

- Reduced peak demand in summer and winter
- Improved grid operations from fast, controllable demand flexibility tools
- Lower energy bills
- More stable electric production costs
- Improved comfort, safety, and health
- Improved building resilience and ability to shelter-in-place during outages

Utilities will see reduced capital needs because lower demand will decrease needed transmission and distribution investments. ERCOT and Texas residents will benefit from a more reliable grid that is less vulnerable to increasing extreme weather events.

7. **What activities should the Energy Efficiency division prioritize over the next twelve months?**

The Energy Efficiency division's top priority should be taking action to mitigate the unprecedented summer and winter peak demand expected through 2030. Our top recommendation to that end is the implementation of the 10 EE and DR retrofit measures described in the answer to Question 5.

In addition to the other recommendations included in this response, we offer two more.

First, we recommend that the utilities take additional steps to help customers afford energy efficiency upgrades. Up-front costs are one of the most frequently cited barriers that impede homeowners from purchasing energy efficient upgrades. Utilities can help lower that barrier by **offering financing solutions** to assist customers with energy efficiency improvements or upgrades. Financing can occur via the customer's energy bills or through a separate billing mechanism. The utility might provide this financing itself or facilitate it through a separate third-party entity such as a bank or green bank.

Second, under 16 Tex. Admin. Code §25.181 Texas utilities may currently only offer incentives to switch from gas appliances to electric appliances in the case of "high efficiency combined heating and air conditioning systems." We support this fuel switching example, primarily because electric heat pump technology can be many times more efficient than combustion technology. We recommend, however, that this allowance be extended to **include switching from less efficient gas-powered water heaters to electric heat pump water heaters** as these conversions can have rapid paybacks to consumers due to the much higher efficiency of heat pumps. Moreover, electric heat pump water heaters can be enrolled in demand response programs that curtail their load during high-demand hours, mitigating their impact on peak load without affecting customer comfort.

Executive Summary for Project No. 56517

Prepared by: Mike Specian, PhD, American Council for an Energy-Efficient Economy
Submitted on May 23, 2024

The electric grid in Texas is currently straining to handle record peak demand in both winter and summer, and ERCOT projects that peak demand will rise by more than three-quarters to 152 GW in 2030. We therefore recommend that Texas address its need to shave peak demand by placing additional emphasis on demand-side measures that will reduce energy consumption during peak periods. To do so, Texas should increase:

- Its peak demand reduction goals by at least 1% per year for both the summer and winter seasons through at least 2030, and
- The level of its energy efficiency resource standard from an amount of energy equivalent to 0.4% of its summer-weather adjusted peak demand to 1% per year through at least 2030. We recommend that a complementary target based on winter-weather adjusted peak demand be introduced as well.

Both avoided electricity system costs and demand-side measure savings vary as a function of time. We therefore recommend that standard offer and market transformation programs recognize that certain hours of the day are more valuable from a program design perspective so that energy resources can be appropriately optimized to meet customer needs at lowest cost.

Texas has historically had some very good energy efficiency (EE) and demand response (DR) programs, albeit with low saving goals and low funding. We recommend that Texas utilities begin planning for the following 10 programs, all of which have large peak demand savings and appear to be cost-effective to the utilities. If deployed aggressively under statewide direction through 2031, these programs could serve over 14 million Texas households and offset about 15 GW of summer peak load and 25 GW of winter peak load, and at approximately half the proposed cost to build 10 GW of new natural gas generation:

- Program to replace electric furnaces with ENERGY STAR heat pumps (EE)
- Attic insulation and sealing incentive program (EE)
- Smart thermostat incentive program (EE)
- Heat pump water heaters incentive program (EE)
- Central air conditioner demand response program with smart thermostat control (DR)
- Water heater demand response program (DR)
- Electric vehicle managed charging program (DR)
- Low-income program package (EE)
- Monitoring-based commissioning (EE)
- Small business direct installation (EE)

As a starting point, we identify two particular opportunities that should receive accelerated attention: 1) smart thermostat control for central air conditioning and electric heating and 2) replacing electric furnaces with ENERGY STAR heat pumps at the time existing central air conditioners need to be replaced.

There are several actions Texas can take to strengthen and track the success of low-income and hard-to-reach programs. We recommend the following:

- Texas increases its current requirements that at least 10% of EE spending and 5% of EE savings come from low-income and hard-to-reach customers, respectively. Instead, at least 25% of total efficiency savings should be realized by low-income and hard-to-reach customers, bringing the savings target for this group in line with that group's percentage of the total Texas population.

- Utilities direct customers at risk of utility disconnection due to nonpayment toward energy efficiency measures that could lower their energy burdens.

- Texas considers a requirement for its utilities to track their low-income customers' energy burdens, i.e., the percentage of household income spent on energy costs. We further recommend establishing a target that demand-side resources be used to keep household energy burdens below 6%.

- A requirement that utilities lead or participate in a robust community engagement process to ensure that low-income and hard-to-reach programs are optimally designed to benefit these customers.

- Utilities lower language-related barriers to entry for its demand-side programs by instituting a process to determine which languages need to be offered in their utility territory to improve equitable access, and taking actions to actually expand that access.

- Utilities track the number of low-income program participants in terms of services received.

Utilities can lower the barrier to entry for low-income, hard-to-reach, and market-rate customers by offering financing solutions to assist customers with the up-front costs of energy efficiency improvements or upgrades. Financing can occur via the customer's energy bills (i.e., on-bill financing) or through a separate billing mechanism.

Finally, we recommend that Texas expand its fuel switching allowance to include conversion from less efficient gas-powered water heaters to electric heat pump water heaters as these conversions can have rapid paybacks to consumers due to the much higher efficiency of heat pumps.