Role of Efficiency & Demand Response to Meet Near-Term Regional Power Demand

HOUSTON ENERGY TRANSITION INITIATIVE

MORE ENERGY, LESS EMISSIONS

GREATER HOUSTON PARTNERSHIP

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Houston region and broader Texas Gulf Coast face a structural energy inflection point. Rapid industrial expansion, accelerating data center development, advanced manufacturing growth, and broad-based electrification are collectively driving electricity demand to historically elevated levels across both the Electric Reliability Council of Texas (ERCOT) and Midcontinent Independent System Operator (MISO) Texas markets. After more than a decade of relatively modest annual load growth averaging roughly 1–2% across Texas, ERCOT is now projecting peak demand growth rates that are several multiples of historical trends, with total system load expected to increase by tens of gigawatts over the next decade. In the Houston region specifically, large industrial projects, liquefied natural gas (LNG) infrastructure, petrochemical expansion, and hyperscale data centers are concentrating significant new demand growth within a compressed timeframe, creating substantial near-term reliability, infrastructure, and affordability challenges for both utilities and customers.

Meeting this scale of demand growth will require utilities, regulators, and customers to deploy generation, transmission, distribution, and customer-side resources in parallel. While continued investment in generation capacity and transmission infrastructure remains essential to maintaining long-term system reliability and supporting economic growth, many of these large-scale infrastructure projects require extended development timelines and significant capital investment. Energy efficiency (EE) and demand response (DR) programs provide highly complementary, near-term tools that can help moderate system strain while broader infrastructure investments are planned and deployed. EE programs reduce overall energy consumption and slow the pace of load growth, while DR programs provide flexible load reductions during periods of peak demand and grid stress. Although ERCOT and MISO Texas use different market structures and demand response frameworks, both provide opportunities to use customer-side flexibility to improve reliability and reduce system costs. Together, these demand-side resources can enhance grid reliability, reduce wholesale market volatility, improve resilience during extreme weather events, and help optimize future infrastructure investments, ultimately supporting more affordable and sustainable system expansion.

This report evaluates how EE and DR can reduce grid strain while supporting ratepayer affordability and economic competitiveness across the 2030 and 2035 planning horizons. The analysis is grounded in a 2024 baseline year and draws upon publicly available utility data, ERCOT and MISO publications, program evaluation reports, and previously published research. Consistent with HETI's all-of-the-above power management approach, this report treats energy efficiency and demand response as demand-side complements to continued investment in generation, transmission, storage, and grid modernization.

KEY FINDINGS:

- Energy efficiency programs in ERCOT and MISO Texas deliver measurable, cost-effective reductions in electricity consumption across all customer classes, with all investor-owned utilities (IOU) portfolios demonstrated to be cost-effective in PY2024.
- Demand response resources provide critical peak load relief and operational flexibility, particularly during extreme weather events that stress grid infrastructure.
- EE and DR programs in the Houston region represent significant contributions for Texas, with CenterPoint accounting for over 40% of ERCOT's IOU aggregate demand reduction and energy savings in 2024 and MISO demand response participation increased 2.3% year-over-year, with approximately 700 MW estimated in the MISO Texas footprint.
- Large-load demand response can serve as a near-term economic development tool when flexible loads can reduce, shift, or self-manage demand during constrained grid hours.
- Combined deployment of EE and DR can optimize supply-side infrastructure investment, reduce ratepayer costs, and sustain near-term economic growth by addressing localized grid constraints.
- Capturing additional value from EE and DR will require targeted deployment, earlier engagement with large loads, and stronger coordination across utilities, customers, market participants, and regulators.
- Large-load customers that distinguish between mission-critical demand, flexible operating load, and on-site resilience resources can reduce interconnection risk while creating additional reliability value.
- Emerging high-impact technologies and targeted deployments (behind-the-meter solar-plus-storage, variable speed HVAC, smart controls) can be networked to amplify the impact of traditional EE and DR programs and create new load flexibility pathways.
- Targeted financing mechanisms, including Commercial Property Assessed Clean Energy (C-PACE), performance contracts, and on-bill programs, are essential to unlock the full potential of efficiency investment, particularly for commercial and industrial customers.

The central finding of this report is that energy efficiency and demand response can create measurable grid "headroom" during the same period when major infrastructure projects are being planned, financed, permitted, and built. The question facing Houston is not whether to invest in supply-side or demand-side resources, but how to deploy both together to support faster, more affordable, and more reliable economic growth.

609 MW	$0.02/kWh	4,099 MW
Evaluated Demand Reduction Texas IOU EE Programs, PY2024[1]	Lifetime Cost of Saved Energy Texas IOU Portfolio, PY2024[2]	ERCOT Wholesale DR Capacity PY2024 (4.8% of peak demand)[3]

Exhibit 1. Texas Energy Efficiency and Demand Response at Scale, Program Year 2024 (PY2024).

[1] Public Utility Commission of Texas, Annual Energy Efficiency Plan and Report (EEPR) filings for PY2024.
[2] Tetra Tech, PY2024 IOU Energy Efficiency Report, All Volumes.
[3] Federal Energy Regulatory Commission (FERC), *Assessment of Demand Response and Advanced Metering, Office of Energy Policy and Innovation, 2025.*

WHY THIS MATTERS FOR HOUSTON

For Houston, energy efficiency and demand response are not simply conservation strategies, they are near-term power management tools that can help the region compete for economic growth. As industrial expansion, data centers, advanced manufacturing, and electrification drive new demand across ERCOT and MISO Texas, the region must preserve reliability and affordability while continuing to attract major investment. That will require building new generation, transmission, distribution, and storage infrastructure while also making better use of the grid capacity that already exists.

Houston's competitive advantage will increasingly depend not only on how much power can be built, but how efficiently existing infrastructure can accommodate new investment while additional generation and transmission come online.

Efficiency can permanently reduce electricity consumption across homes, businesses, industrial facilities, and commercial buildings, while demand response can provide flexible capacity during the limited hours when the grid is most constrained. Together, these resources can reduce peak demand, lower customer costs, improve infrastructure utilization, and help manage localized constraints that could otherwise slow economic development.

As large-load interconnection processes continue to evolve, Houston can strengthen its economic development position by encouraging new data centers, industrial projects, and advanced manufacturing facilities to incorporate efficiency and load-flexibility readiness from the earliest stages of project planning. Large loads that can verify demand reductions, curtailment capability, behind-the-meter resilience, or differentiated operating profiles during constrained hours may help reduce grid integration risk while supporting faster and more cost-effective growth.

Houston has an opportunity to demonstrate that customer-side resources can become part of a broader strategy for attracting investment, strengthening reliability, and improving affordability. By pairing continued investment in generation, transmission, and distribution with targeted deployment of energy efficiency and demand response, the region can power more economic growth with lower system strain and reinforce its position as one of the nation's most competitive locations for large-load development.

INTRODUCTION: THE HOUSTON ENERGY & POWER CHALLENGE

Houston's economy serves as a global hub for energy-intensive industry, rapidly expanding technology infrastructure, and a growing residential population, all of which continue to increase electricity demand across the region. The electrification of commercial buildings and industrial processes, the rapid growth of artificial intelligence (AI) computing loads, and the reshoring of advanced manufacturing are accelerating power demand growth across both ERCOT and MISO Texas service territories.

ERCOT, which manages the electric grid for approximately 90 percent of Texas[4], and MISO Texas, which serves the eastern portion of the state, both project substantial load growth through 2030 and 2035. Utilities, grid operators, policymakers, and private-sector stakeholders must now expand generation, transmission, and distribution infrastructure at an unprecedented pace to maintain reliability and support continued economic growth. At the same time, rapidly rising demand is increasing pressure on electricity prices, tightening reserve margins during peak periods, and intensifying the need for flexible system resources that can strengthen grid resilience during extreme weather events and periods of system stress.

Energy efficiency (EE) and demand response (DR) provide essential complementary tools that can help manage these near-term challenges while new generation, transmission, storage, and other infrastructure is planned, financed, and deployed. EE programs reduce overall energy consumption and moderate the pace of load growth, while DR programs provide flexible and dispatchable load reductions during periods of peak demand and grid stress. Together, these demand-side resources can improve system reliability, reduce wholesale market volatility, optimize infrastructure utilization, and support more cost-effective long-term grid expansion.

Because EE and DR programs can often scale more quickly than major infrastructure projects, they can help create near-term "headroom" on the grid as slower-to-market resources are developed. This role is especially important in an all-of-the-above approach to meeting growing electricity demand, where near-term demand-side measures can complement longer-term investments in generation, transmission, storage and grid modernization. Modern energy efficiency technologies can also deliver savings without requiring customers to sacrifice comfort, productivity, or utility. In many cases efficient equipment and smart controls are designed to maintain or improve service levels while reducing energy use. As a result, utilities and customers can use EE and DR programs to help bridge the gap between accelerating demand growth and the completion of large-scale energy investments.

This report examines how EE and DR resources can support reliability, affordability, and economic competitiveness within the ERCOT and MISO Texas markets. The analysis uses a study-of-studies methodology that synthesizes existing research, publicly available utility data, ERCOT and MISO publications, and program evaluation findings to quantify the potential contribution of these resources across the 2030 and 2035 planning horizons.

DEFINING THE RESOURCES: ENERGY EFFICIENCY AND DEMAND RESPONSE

Precise and consistent definitions are foundational to a credible evaluation of EE and DR potential. This analysis adopts the definitions established by the Public Utility Commission of Texas (PUCT):

RESOURCE TYPE	DEFINITION AND EVALUATION BASIS
Energy Efficiency (EE)	Permanent or long-lasting reductions in electricity consumption (GWh) and associated coincident peak reductions (MW) achieved through equipment upgrades, building improvements, or operational changes. EE reduces energy use across multiple hours or seasons and is evaluated based on annual and lifetime energy savings.
Demand Response (DR)	Temporary, dispatchable, or behavioral reductions in electricity demand in response to price signals, incentives, or grid conditions, typically during specific hours or system events. DR is evaluated based on event-based load reduction, availability, and system flexibility value.

Exhibit 2. Energy efficiency and demand response definitions as established by the Public Utility Commission of Texas (PUCT).

These two resources are complementary but distinct. Energy efficiency permanently lowers electricity use and can reduce coincident peaks that contribute to grid strain. Demand response temporarily shifts or curtails load when system conditions require relief. This analysis disaggregates programs exhibiting characteristics of both categories to prevent double counting.

For the purposes of this study, grid strain refers to conditions in which electricity demand approaches or exceeds the operational, transmission, or distribution capacity of the power system. Key indicators include peak demand relative to capacity reserves; congestion on transmission and distribution assets; increased reliance on high-cost emergency resources; reduced flexibility during extreme weather events; and accelerated asset degradation.

[4]Electric Reliability Council of Texas (ERCOT), *About ERCOT* program webpage, https://www.ercot.com/about, accessed 2026.

LOAD GROWTH IN THE HOUSTON REGION

Load forecasts from ERCOT and the utilities serving the Houston region confirm that electricity demand is on a sustained upward trajectory. ERCOT's long-term projections[5] indicate significant demand growth across Texas through 2030 and 2035, driven by industrial, data centers, artificial intelligence (AI) and electrification loads. CenterPoint Energy has identified distribution-level constraints in multiple high-growth corridors within the Houston metropolitan area. Entergy Texas serves a mix of industrial and residential customers within the MISO Texas footprint and operates under distinct planning and cost-effectiveness frameworks.

A key distinction for demand-side strategy is that much of the incoming load associated with new construction, HVAC, refrigeration, and major equipment additions is expected to meet current code or equipment standards, while the largest incremental efficiency gains are typically available in older buildings, legacy equipment, and existing infrastructure that have not yet been modernized.

METRIC	ERCOT	MISO TEXAS
2024 Baseline Peak (MW)	85,559[6]	3,780[7]
2030 Projected Peak (MW)	139,000[8]	4,895[9]
2035 Projected Peak (MW)	154,000	5,641

Exhibit 3. Peak demand 2024 baseline and projections for 2030 and 2035 in ERCOT and MISO Texas based on 2024-2025 filing reports.

[5]Electric Reliability Council of Texas (ERCOT), 2025 *Long-Term Demand and Energy Forecast (LTDEF)*, 2025.
[6]Electric Reliability Council of Texas (ERCOT), *Capacity, Demand, and Reserves (CDR)* reporting and associated load forecast filings.
[7]Entergy Texas, *Southeast Texas Energy Plan (STEP)* and associated load forecast filings; Midcontinent Independent System Operator (MISO), Long-Range Planning materials, 2024-2026.
[8]Electric Reliability Council of Texas (ERCOT), 2025 *Long-Term Demand and Energy Forecast (LTDEF)*, 2025.
[9]Entergy Texas, *Southeast Texas Energy Plan (STEP)* and associated load forecast filings; Midcontinent Independent System Operator (MISO), Long-Range Planning materials, 2024-2026.

KEY LOAD GROWTH CATEGORIES

Multiple large-load categories are driving this growth trajectory, each with distinct implications for demand-side management strategy:

INDUSTRIAL AND PETROCHEMICAL EXPANSION

The Houston Ship Channel and surrounding industrial complex represent one of the highest concentrations of electricity-intensive manufacturing in North America. Ongoing capital investments in LNG export facilities, chemical manufacturing, and industrial electrification projects are adding significant new industrial loads to the regional grid. These large customers are also strong candidates for demand response participation because many industrial processes possess operational flexibility and can shift or curtail load during periods of peak system demand.

DATA CENTERS AND AI COMPUTING HARDWARE

Data center and AI computing development is increasing both system-level demand and localized transmission and distribution pressure. While baseload consumption from data center operations is substantial and largely inflexible, some supporting systems and noncritical workloads may create efficiency or flexibility opportunities discussed later in this report.

ADVANCED MANUFACTURING AND RESHORING

Federal incentives supporting domestic semiconductor manufacturing, battery supply chain development, and clean energy component manufacturing are attracting significant new industrial investment to Texas. Expanding production of batteries, grid equipment, advanced materials, and other energy-related technologies is increasing electricity demand across the manufacturing sector while reinforcing Texas' position as a major industrial and logistics hub. These facilities typically require substantial and continuous power loads, but they also present important opportunities to integrate high-efficiency technologies, advanced energy management systems, and flexible load capabilities during the design and construction phase. Incorporating energy efficiency measures into greenfield developments can reduce long-term operating costs, moderate regional load growth, and improve overall system resilience before consumption patterns become fully established.

RESIDENTIAL AND COMMERCIAL ELECTRIFICATION

As consumers across the Houston region adopt higher efficiency and lower operational cost HVAC units, including heat pumps, as well as more electric appliances, electric vehicles and electronics, residential and commercial electricity demand continues to grow. These new loads may also create future flexibility opportunities when paired with appropriate equipment, customer programs, and market pathways. The largest incremental energy efficiency opportunity is often found in older homes, commercial buildings and existing equipment fleets that were built or installed under earlier standards and may no longer reflect current technology performance.

ENERGY EFFICIENCY: CURRENT PROGRAMS AND MEASURABLE IMPACT

Texas utilities administer EE programs within a distinctive regulatory environment in which customer participation remains voluntary, while investor-owned utilities (IOUs) are required to meet minimum energy efficiency goals established by the Public Utility Commission of Texas (PUCT). The PUCT has established the Energy Efficiency Goal framework for IOUs operating in Texas. IOUs within ERCOT administer efficiency programs under PUCT oversight. Utilities in the MISO Texas footprint operate under both PUCT and Federal Energy Regulatory Commission (FERC) jurisdiction, depending on the function and regulatory context.

These programs comprise a portfolio of demand-side resources that include both permanent efficiency improvements and load management capabilities. Texas IOU load management programs are commonly reported within utility EE portfolios because they help meet PUCT demand-reduction goals, but their grid value is different from permanent efficiency as they provide dispatchable peak reduction rather than continuous energy savings. Permanent efficiency measures reduce energy consumption and peak demand on an ongoing basis through equipment, building and control-system performance improvements, while load management or demand response programs provide dispatchable or event-based reductions during peak demand or grid-stress periods. For purposes of this report, energy efficiency and demand response are treated as distinct but complementary demand-side resources.

Section 39.905 of the Texas Public Utility Regulatory Act (PURA) "Goal for Energy Efficiency" is the foundational statutory mandate that directs the PUCT to ensure that investor-owned electric utilities (IOUs) pursue measurable energy efficiency. The statute requires the PUCT to ensure that electric utilities administer energy efficiency incentive programs in a market-neutral manner, that all customers in all customer classes have a choice of and access to energy efficiency alternatives that allow each customer to reduce energy consumption, peak demand, or energy costs, and that each electric utility acquires minimum quantifiable reductions in demand annually from energy efficiency programs. The statute also requires the PUCT to provide, by rule, a method to establish each utility's annual energy savings goal, based on the existing and expected usage of electricity delivered in a utility's service area that is required to pay the annual energy efficiency cost recovery fee.

16 Texas Administrative Code (TAC) Sections 25.181 and 25.182 together comprise the PUCT's "Energy Efficiency Rule (EE Rule)" and Energy Efficiency Cost Recovery Factor framework implementing PURA Section 39.905 goals. PURA requires the EE rule to ensure that IOUs administer energy efficiency programs that are available to utility customers and requires each IOU to achieve minimum EE goals through market-based standard offer programs (SOPs), targeted market transformation programs (MTPs), or utility self-delivered programs:

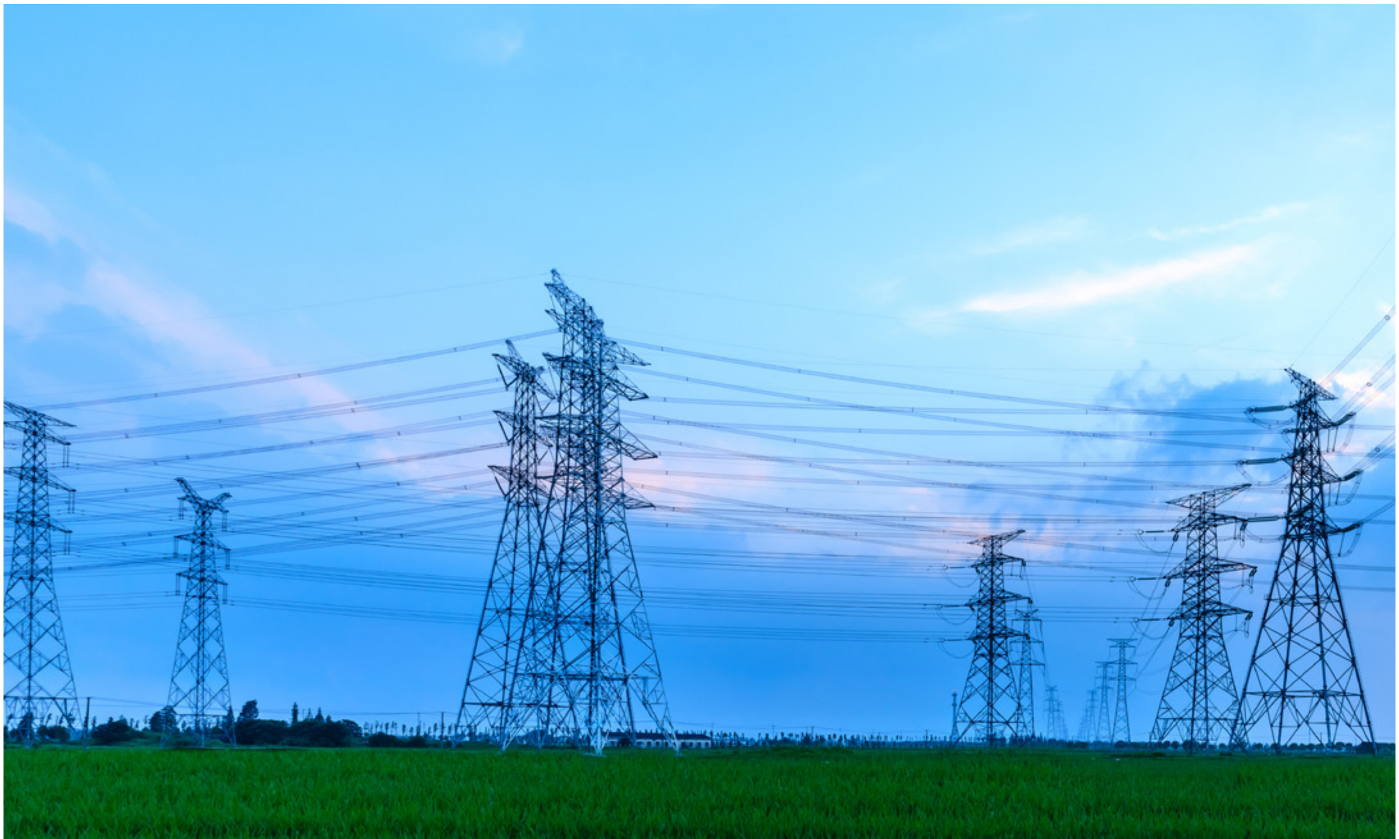
- **Standard Offer Programs (SOPs):** deliver high-efficiency products and services to customers through financial incentives. Utilities develop and work with contractors to provide measures, such as insulation or HVAC. SOPs can be implemented directly by IOU staff or through IOU-selected implementation contractors.
- **Market Transformation Programs (MTPs):** provide financial and non-financial incentives, such as technical assistance and education, to customers in harder-to-serve markets or for select energy efficiency technologies. MTPs allow for the transition from extensive market intervention activities toward a largely self-sustaining market and are executed by IOU-selected implementation contractors.
- **Hard-to-Reach Programs (HTRs)**: serve residential customers with an annual household income at or below 200% of the federal poverty guidelines. All IOUs are required to achieve no less than 5% of their total demand reduction goal through HTR programs. HTR programs have similar delivery models to residential SOPs.
- **Targeted Low-Income (LI) Programs:** LI programs coordinate with the existing federal weatherization program[10]. ERCOT IOUs must spend no less than 10% of each program year's energy efficiency budget on targeted LI efficiency programs. The outside-of-ERCOT utilities can also choose to offer LI programs.
- **Load Management Programs:** designed to reduce peak demand for periods of 2-4 hours when used by ERCOT or for local IOU system reliability. Load management programs are specific to the season (winter or summer) and are offered to both commercial and residential customers.

The minimum EE goal is structured as 30% of annual growth in peak demand, until that amount equals or exceeds 0.4% of the IOU's prior-year summer weather-adjusted peak demand. At that trigger point, the goal becomes 0.4% of the prior-year summer peak each year going forward. Demand goals are calculated by multiplying peak demand values at the source by the applicable goal metric for each IOU (30% or 0.4% of peak demand) and by line losses. Energy savings goals are calculated by applying a 20% conservation load factor (CLF) to the demand goal calculation.

This statutory framework has provided a consistent basis for utility-administered EE programs in Texas for more than a decade. However, the current goal structure was established in a different load-growth environment. The 0.4% continuing goal became effective in 2011 and the 30% annual growth target applies beginning in the 2013 calendar year. Since that time, electricity demand in Texas has shifted from a more moderate growth outlook to a period of accelerated growth driven by industrial expansion, data centers, electrification, population growth, and broader economic development. This change in system conditions suggests that the current goal structure may warrant re-examination to assess whether it remains appropriately calibrated for the current higher-growth planning environment.

In response to PURA's legislative directive, the PUCT established an Energy Efficiency Cost Recovery Factor (EECRF) mechanism to allow utilities to recover reasonable costs associated with administering cost-effective energy efficiency programs and to

[10] Peak demand and annual energy savings estimates are derived from most recent Texas IOU performance levels indicated in PUCT annual Energy Efficiency Plan and Report (EEPR) filings and related utility annual reports.



provide a performance incentive for utilities that exceed their approved energy and demand reduction goals. The EECRF framework has been updated over time, including refinements to the terminology and methodology used to calculate utility performance incentives. In addition, the EE Rule requires utilities to direct at least 10% of each energy efficiency budget to targeted low-income customers and requires independent evaluation, measurement and verification (EM&V) of reported program savings.

ACTUAL UTILITY PERFORMANCE RELATIVE TO GOALS

Texas IOU energy efficiency portfolios administered under PUCT rules achieved approximately 609 MW[11] of combined evaluated demand-side peak reduction[12] and approximately 603 GWh of evaluated annual energy savings directly associated with ongoing energy efficiency impacts across the state's eight regulated IOUs during program year 2024 (PY2024). Total peak reduction of 609 MW across Texas IOU efficiency portfolios was achieved through 197 MW from energy efficiency projects across Texas and 412 MW from load management in program year 2024. The reported 197 MW from energy efficiency projects represents permanent efficiency savings which reduce the underlying demand and energy baseline over the useful life of installed measures, while the 412 MW from load management capability provides dispatchable or event-based peak reduction during system need. Reporting annual program year impacts by these two resource categories clarifies how much of the reported MW impact reflects durable reductions from upgraded infrastructure and how much reflects flexible capacity that can be called upon during peak demand or grid-stress events.

These efficiency programs were implemented primarily through Standard Offer Programs (SOPs) and Market Transformation Programs (MTPs), at a cost of roughly 2 cents per kilowatt-hour saved and $20-$65 per kilowatt reduced, supported by approximately $150 million in financial incentives, customer rebates, and implementation expenditures. The reported impacts reflect evaluated savings under the Texas Technical Reference Manual (TRM) and PUCT EM&V protocols, which standardize avoided peak demand and annual energy savings calculations across utility territories.

While Texas's statutory energy efficiency goals are modest relative to projected load growth, actual utility program performance has often exceeded the minimum requirements established under the PUCT's Energy Efficiency Rule. This distinction is important: the policy question is not whether utilities are meeting current goals, but whether the current goal structure, program budgets, and cost recovery framework are calibrated to the scale of Texas's future reliability, affordability, and economic development needs.

CenterPoint Energy Houston Electric provides a clear example, representing the largest IOU-administered efficiency portfolio in the Houston region and over 40% of ERCOT's IOU aggregate demand reduction and energy savings in 2024. CenterPoint's reported peak demand reduction goal was 66.26 MW and its energy savings goal was 116 GWh for program year 2024. Actual achieved savings were substantially higher, totaling approximately 236 MW of peak demand reduction and 229 GWh of energy savings. This means CenterPoint achieved more than three times its 2024 peak demand reduction goal and nearly twice its energy savings goal. Entergy Texas also achieved significantly more demand reduction and energy savings than its 2024 program year goals, with a reported 24 MW of peak demand reduction against a goal of 17 MW and a reported 43 GWh of energy savings against a goal of 30 GWh. These results indicate that utility-administered EE portfolios deliver measurable savings above the statutory minimum, even within current program and cost recovery constraints.

At the same time, strong performance against existing goals should not be interpreted as evidence that the current framework is sufficient for the next phase of load growth. Rather, it suggests that there is demonstrated market capability and utility implementation experience that could support higher levels of savings if policymakers determine that expanded goals, updated cost caps, or revised program authority are warranted.

UTILITY/MARKET	PROGRAM YEAR	DEMAND REDUCTION GOAL	ACTUAL DEMAND REDUCTION	ENERGY SAVINGS GOAL	ACTUAL ENERGY SAVINGS
ERCOT IOUs Aggregate	2024	191 MW	547 MW	334 GWh	506 GWh
CenterPoint Energy	2024	66 MW	236 MW	116 GWh	229 GWh
Outside-of-ERCOT IOUs Aggregate	2024	40 MW	62 MW	70 GWh	99 GWh
Entergy Texas / MISO	2024	17 MW	24 MW	30 GWh	43 GWh

Exhibit 4. Actual utility performance relative to goals for Program Year 2024. Source: Tetra Tech and PUCT, *PY2024 Investor-Owned Utilities Energy Efficiency Report*, Executive Summary Sections 1.3-1.7, utility-specific EEPR filings where noted.

[11] Public Utility Commission of Texas, Annual Energy Efficiency Plan and Report (EEPR) filings for PY2024; Tetra Tech, PY2024 IOU Energy Efficiency Report, All Volumes.
[12] Public Utility Commission of Texas, Annual Energy Efficiency Plan and Report (EEPR) filings for PY2024; Tetra Tech, PY2024 IOU Energy Efficiency Report, All Volumes.

PROGRAM OFFERINGS BY CUSTOMER CLASS

Utility EE programs span three broad customer categories, with distinct leading measures and efficiency levers across each:

CUSTOMER CLASS	LEADING MEASURES	TOP KWH-SAVING PROGRAMS	TOP MW-REDUCTION LEVERS
Residential	HVAC replacement/heat pumps; smart thermostats; weatherization + building envelope; new home construction + building codes	Oncor Retail Products MTP; CenterPoint High-Efficiency Home MTP	Smart thermostat / demand response
Commercial	LED lighting + controls; HVAC + building controls; retro-commissioning; small business direct install	CenterPoint Commercial SOP; Oncor Commercial SOP; CenterPoint Commercial MTP (SCORE)	Commercial load management SOPs; building automation controls
Industrial	Custom SOP site-based projects: compressed air, motors, variable frequency drives (VFD), process heat recovery, controls retrofits	Commercial Solutions MTP (C&I custom); Entergy Texas Commercial Solutions MTP	Load management / curtailment agreements; MISO DRR Type I & II

Exhibit 5. Leading energy efficiency measures and programs in ERCOT and MISO Texas by customer class.

COST-EFFECTIVENESS OF ENERGY EFFICIENCY

Energy efficiency continues to rank among the lowest-cost energy resources available to both utilities and customers. Program Year (PY) 2024 Evaluation, Measurement, and Verification (EM&V) reports submitted to the Public Utility Commission of Texas (PUCT) show that every investor-owned utility (IOU) EE portfolio operating under PUCT jurisdiction achieved strong cost-effectiveness results.

Analysts commonly use the lifetime cost of saved electricity (LCSE) to evaluate EE portfolio performance, expressed in dollars per kilowatt-hour ($/kWh) saved over the useful life of installed measures. This metric represents the total program and participant costs required to achieve one lifetime kilowatt-hour of electricity savings, and it reflects the cost of acquiring avoided energy consumption rather than purchasing or generating new electricity supply. From the utility system perspective, the LCSE can be viewed as the resource acquisition cost of energy efficiency. From the customer perspective, those expenditures produce long-term bill savings that substantially exceed the upfront investment.

For PY2024, the preliminary portfolio-level LCSE across all Texas IOUs is approximately $0.02 per kWh saved[13], meaning utilities and customers together acquired long-term electricity reductions at a cost well below the retail cost of delivered electricity and generally below the cost of new generation resources. These findings demonstrate that EE remains a highly economical resource for meeting load growth and reliability needs.

Another important indicator is the benefit-cost ratio (BCR), which compares the monetized benefits of EE measures to their associated costs. A BCR greater than 1.0 indicates that benefits exceed costs and that the program creates net economic value. Benefits typically include avoided energy purchases, avoided generation capacity, reduced transmission and distribution costs, and in some cases avoided environmental compliance costs. Costs generally include utility incentives, administration, implementation, and participant contributions.

While preliminary PY2024 results confirm that all IOU portfolios remained cost-effective, the most recent utility-level sector-specific benefit-cost ratios are reported in the PY2023 EM&V analysis. Commercial EE programs produced the strongest economic performance for the most recent reported data in PY2023. Across IOU territories, commercial portfolios achieved BCRs exceeding 4.0[14], indicating that every dollar invested generated more than four dollars in system and customer benefits over the life of the measures. Commercial programs also achieved particularly low LCSE values (approximately $0.010 - $0.017 per lifetime kWh saved), reflecting the scale of efficiencies and large, persistent savings associated with commercial lighting, HVAC, controls, and process improvements. These results demonstrate that commercial EE remains one of the most cost-effective demand-side resources available in Texas.

Residential EE programs also demonstrated substantial economic value. Residential portfolio BCRs averaged approximately 3.0, with utility-specific results ranging from 2.4 to 3.6[15], indicating that residential EE investments returned roughly 2.4 – 3.6 times their costs in avoided system and customer expenditures. Residential LCSE values ranged from approximately $0.014 - $0.021 per

[13] Tetra Tech and Public Utility Commission of Texas (PUCT), PY2024 IOU Energy Efficiency Report, All Volumes.
[14] Tetra Tech and Public Utility Commission of Texas (PUCT), PY2023 Evaluation, Measurement and Verification (EM&V) Report, Texas Investor-Owned Utility Energy Efficiency Programs, utility cost-effectiveness results, All Volumes.
[15] Tetra Tech and Public Utility Commission of Texas (PUCT), PY2023 Evaluation, Measurement and Verification (EM&V) Report, Texas Investor-Owned Utility Energy Efficiency Programs, utility cost-effectiveness results, All Volumes.

lifetime kWh saved, remaining highly competitive with supply-side alternatives despite the smaller scale and greater customer acquisition costs typically associated with residential measures. These programs continue to provide significant long-term benefits through improved home efficiency, reduced customer bills, and lower peak demand requirements.

Overall, the most recent PY2023-PY2024 results confirm that all PUCT-regulated IOU EE portfolios delivered net economic benefits and acquired energy savings at costs substantially below alternative supply-side resources, underscoring the importance of energy efficiency as a foundational component of Texas' least-cost energy strategy. Because data centers are one of the fastest-growing and most concentrated large-load categories in the Houston region, this report treats data center efficiency as a priority application of the broader EE framework before turning to systemwide achievement scenarios.

DATA CENTER EFFICIENCY: A STRATEGIC PRIORITY

Data centers represent a critical intersection of load growth, infrastructure planning, and energy efficiency opportunities for the Houston region. Traditional enterprise and cloud data centers already contribute significant and highly concentrated electricity demand due to their continuous operations and high load factors. The rapid expansion of AI-focused data centers and high-performance computing facilities is accelerating this challenge even further. AI data centers typically require substantially greater power density, more intensive cooling systems, and significantly larger overall electricity consumption than conventional data centers, creating both system-level load growth pressures and localized transmission and distribution constraints.[16] In many areas, these facilities can create substation and transformer bottlenecks even where broader regional generation capacity remains available.

At the same time, data centers offer meaningful opportunities for both energy efficiency (EE) improvements and flexible load management. Data center efficiency and data center flexibility are treated separately in this report because they create different types of grid value. Efficiency can reduce the amount of electricity needed for a given computing output, while flexibility can reduce or shift load during constrained hours where operationally feasible.

Department of Energy (DOE) and Lawrence Berkeley National Laboratory best practices[17] identify high-impact efficiency strategies across IT systems, air management, cooling systems, electrical systems, and heat recovery. These include improved airflow management, right-sizing of IT and cooling equipment, optimized chiller plant operations, liquid cooling technologies, economizers for free cooling, improved uninterruptible power supply (UPS) efficiency, advanced power management software, and facility-level heat recovery. Data center efficiency is commonly assessed using metrics such as power usage effectiveness (PUE), along with ENERGY STAR benchmarking and other federal or international efficiency guidance.[18] These tools can help utilities, customers and policymakers distinguish between facilities that meet current best practices and projects that deliver incremental efficiency gains beyond standard design.

For Houston's economic development strategy, improving data center efficiency is not only an energy cost issue but also an important transmission, distribution, and interconnection strategy that can reduce strain on substations and accelerate project deployment timelines.

However, because many new data centers are already designed to operate at high efficiency levels, utility incentives should be structured to avoid subsidizing measures that would likely have occurred without program support.

Program design may need to include customer surveys, baseline screening, or other approaches used in other states to assess free ridership and confirm whether claimed savings are truly incremental.

This issue is especially important for large-load customers because the practical effect of efficiency gains may differ from traditional commercial and industrial projects. In some cases, efficiency improvements may reduce electricity consumption and peak demand for a defined workload. In other cases, the customer may use the additional available electrical or cooling capacity to support more servers, denser AI workloads or expanded operations. In those cases, the facility may become more productive and efficient per unit of computing output, while total site electricity consumption may remain flat or continue to grow. As a result, data center efficiency programs should clearly distinguish between gross efficiency improvements, net energy savings, avoided peak demand, and capacity that is redeployed to serve additional load.

A targeted data center efficiency program could provide meaningful value if it is designed around measurable, incremental savings and grid benefits.

Program criteria could prioritize projects that exceed recognized efficiency benchmarks, reduce coincident peak demand, optimize local transmission or distribution upgrades, improve cooling and power-system performance, or enable dispatchable load flexibility during grid-stress periods.

This would allow Texas utilities to support data center growth while ensuring that short-term incentives produce verifiable customer, system and ratepayer benefits.

[16] Houston-specific transmission and distribution constraints referenced in regional utilities' Distribution Cost Recovery Factor (DCRF) filings, Distribution System Resiliency Plans, load growth and substation planning testimony, and PUCT distribution planning filings.
[17] U.S. Department of Energy, *Best Practices Guide for Energy-Efficient Data Center Design* (2024); Tschudi et al., Lawrence Berkeley National Laboratory, *Best Practices for Data Centers* (2024).
[18] ENERGY STAR Data Center Resources and benchmarking tools; International Energy Agency (IEA), *Data Centres and Data Transmission Networks.*

EFFICIENCY ACHIEVEMENT SCENARIOS: 2030 AND 2035 PROJECTIONS

This analysis evaluates energy efficiency's measurable contribution to reducing electricity demand and mitigating peak-period grid strain in ERCOT and MISO Texas using a 2024 baseline and 2030 and 2035 target years. ERCOT peak demand projections were based on the ERCOT system level peak trajectory from the 2024 baseline toward planning forecasts for 2030 and 2035[19]. MISO Texas estimates reflect system-level load growth projections associated with the Entergy Texas service area[20].

Annual energy efficiency acquisition levels were modeled as a percentage of the prior-year summer peak demand, consistent with the policy framework that sets EE goals and shapes EE programs in Texas. Annual peak demand reductions were assumed to persist and accumulate from 2025 through the target year. Avoided energy consumption was estimated using a 20% conservation load factor (CLF), consistent with Texas energy efficiency program evaluation conventions, yielding annual energy savings equal to 1.752 GWh per MW of peak reduction. All values reported represent ranges of cumulative avoided peak demand in MW and associated annual energy savings in GWh/yr relative to the 2024 baseline, attributable to sustained energy efficiency acquisition under each scenario. This analysis estimates values using minimum goal mechanics and published load forecasts and may not reflect actual contracted, achieved or verified savings for any given year under future budgets or program designs[21].

For ERCOT, the cumulative minimum goal energy efficiency is approximately 2,600 MW of peak reduction by 2030 and approximately 5,500 MW of peak reduction by 2035 relative to 2024 baseline. This estimate uses peak targets that are derived from ERCOT internal forecasts, assumes energy efficiency minimum is 0.4% per year of prior-year peak, and energy savings are calculated using a 20% CLF. For MISO Texas, the cumulative minimum goal energy efficiency by 2030 is approximately 100 MW of peak reduction and approximately 200 MW of peak reduction by 2035 relative to 2024 baseline. This estimate infers Entergy Texas' 2024 baseline from its stated peak (MW) and stated percentage growth, interpolates 2030 and 2035 estimates from Entergy Texas' stated target, assumes energy efficiency minimum is 0.4% per year of prior-year peak, and energy uses CLF of 20%.

In addition to the minimum-goal scenario of 0.4% of peak demand per year, additional energy efficiency achievement rate scenarios were also evaluated using the same measurable contribution framework, assumptions, and methodology. A moderate expansion scenario was evaluated at 0.6% of peak demand per year, and a high achievement scenario was evaluated at 1.0% of peak demand per year, consistent with other leading US jurisdictions. The resulting ranges represent the cumulative avoided peak demand attributable to sustained energy efficiency acquisition under each achievement scenario. For ERCOT, the cumulative energy efficiency contribution range is approximately 2,600 MW to 6,500 MW of peak reduction by 2030 and approximately 5,500 MW to 13,700 MW of peak reduction by 2035 relative to 2024 baseline, depending on whether energy efficiency achievement tracks at 0.4% to 1.0% per year. For MISO Texas, the cumulative energy efficiency contribution range is approximately 100 MW to 240 MW of peak reduction by 2030 and approximately 190 MW to 480 MW of peak reduction by 2035 relative to 2024 baseline, depending on whether energy efficiency achievement tracks at 0.4% vs 1.0% per year.

The achievement scenarios presented here estimate the system-level contribution that sustained energy efficiency acquisition could make toward reducing peak demand in ERCOT and MISO Texas. They do not assign the modeled reductions to specific customer classes or end-use sectors. In practice, the achievable resource would be distributed across residential, commercial, institutional, industrial, and other large-load customer segments, with the relative contribution depending on program design, customer participation, technology readiness, incentive levels, and the availability of qualified implementation resources. As a result, these scenarios should be interpreted as a planning-level estimate of the scale of opportunity rather than a sector-by-sector deployment forecast.

To support implementation, future program design and resource planning should translate these system-level ranges into sector- and measure-level opportunity maps.

This would help identify where project development resources should be focused, including high-impact opportunities in commercial buildings, industrial facilities, large campuses, data centers, multifamily housing, retail developments, municipal facilities, and residential HVAC and envelope upgrades. This additional segmentation would improve visibility into which customer classes can deliver near-term peak reduction, which measures are most scalable, and where targeted incentives, technical assistance, aggregation, or financing mechanisms may be needed to convert modeled potential into verified savings.

ACHIEVEMENT RATE	DESCRIPTION
0.4% per year	Current minimum statutory goal under PUCT Rule Section 25.181
0.6% per year	Moderate expansion above statutory floor
1.0% per year	Benchmark consistent with leading US states

Exhibit 6. EE achievement scenarios used to evaluate policy-driven demand reduction and annual energy savings by planning horizons.

[19] Electric Reliability Council of Texas (ERCOT), *2025 Long-Term Demand and Energy Forecast; Report on Capacity, Demand and Reserves*, 2025.

[20] Entergy Texas, *Southeast Texas Energy Plan (STEP)* and associated load forecast filings; Midcontinent Independent System Operator (MISO), Long-Range Planning materials, 2024-2026.

[21] Because this scenario analysis applies achievement rates at the system and service territory level, the results are not allocated by customer class. Sector-specific allocation would require additional program participation, load-shape, end-use, and measure-adoption assumptions beyond the scope of this planning-level estimate.

ERCOT: PEAK DEMAND REDUCTION PROJECTIONS

EE RATE	2030 CUMULATIVE PEAK REDUCTION (MW)	2035 CUMULATIVE PEAK REDUCTION (MW)	SCENARIO CONTEXT
0.4% per year	2,588	5,488	Current minimum goal
0.6% per year	3,882	8,233	Moderate expansion
1.0% per year	6,470	13,721	Leading US states benchmark

Exhibit 7. Projected EE contribution to peak demand reduction in ERCOT by 2030 and 2035 under three achievement scenarios.

MISO TEXAS: PEAK DEMAND REDUCTION PROJECTIONS

EE RATE	2030 CUMULATIVE PEAK REDUCTION (MW)	2035 CUMULATIVE PEAK REDUCTION (MW)	SCENARIO CONTEXT
0.4% per year	97	190	Current minimum goal
0.6% per year	146	286	Moderate expansion
1.0% per year	243	476	Leading US states benchmark

Exhibit 8. Projected EE contribution to peak demand reduction in MISO Texas by 2030 and 2035 under three achievement scenarios.

ERCOT: ANNUAL ENERGY SAVINGS PROJECTIONS (GWH/YR)

EE RATE	2030 CUMULATIVE ENERGY REDUCTION (GWH/YR)	2035 CUMULATIVE ENERGY REDUCTION (GWH/YR)	SCENARIO CONTEXT
0.4% per year	4,534	9,616	Current minimum goal
0.6% per year	6,801	14,424	Moderate expansion
1.0% per year	11,335	24,039	Leading US states benchmark

Exhibit 9. Projected EE contribution to annual energy savings in ERCOT by 2030 and 2035. Applies a 20% Conservation Load Factor (CLF) to convert peak savings (MW) into annual energy savings (GWh), relative to a 2024 baseline.

MISO TEXAS: ANNUAL ENERGY SAVINGS PROJECTIONS (GWH/YR)

EE RATE	2030 CUMULATIVE ENERGY REDUCTION (GWH/YR)	2035 CUMULATIVE ENERGY REDUCTION (GWH/YR)	SCENARIO CONTEXT
0.4% per year	170	334	Current minimum goal
0.6% per year	255	501	Moderate expansion
1.0% per year	425	834	Leading US states benchmark

Exhibit 10. Projected EE contribution to annual energy savings in MISO Texas by 2030 and 2035. Applies a 20% Conservation Load Factor (CLF) to convert peak savings (MW) into annual energy savings (GWh), relative to a 2024 baseline.

BARRIERS TO ENERGY EFFICIENCY PARTICIPATION

Despite a compelling economic case,[22] several structural barriers continue to constrain energy efficiency (EE) program participation and limit the scale of achievable savings across Texas and the Houston region. Although Texas established statutory energy efficiency goals for investor-owned utilities, the current framework remains relatively modest compared to the scale of projected load growth and still relies heavily on voluntary customer participation rather than mandatory building performance requirements. Texas energy efficiency targets remain below those achieved in many other large electricity markets in part because of differences in statutory savings requirements, program funding levels, market design, and policy frameworks. Many higher-achieving jurisdictions combine utility-administered programs with more aggressive savings targets, building codes, appliance standards, performance incentives, or mandatory building performance requirements, while the Texas framework relies more heavily on voluntary customer participation and utility incentive programs. As ERCOT projects historically elevated demand growth through 2030 and beyond, existing EE program structures may not scale quickly enough to capture the full economic and reliability benefits available from demand-side resources.

In ERCOT's competitive retail market, program delivery is further complicated by the separation between transmission and distribution utilities (TDUs), retail electric providers (REPs), contractors, aggregators and customers. TDUs such as CenterPoint Energy are responsible for administering energy efficiency programs and are incentivized to achieve demand and energy savings, but they generally do not have the same direct retail relationship with end-use customers as REPs. As a result, TDUs often must work through REPs, contractors, or similar market actors to deliver incentives and encourage customer participation. This structure can limit program visibility, reduce customer awareness, and create uncertainty about who is responsible for educating customers, marketing incentives, and converting available program funds into completed projects.

Several persistent barriers contribute to this challenge:

- **Split incentives:** Building owners frequently lack direct financial incentives to invest in efficiency improvements when tenants bear the energy costs, particularly in commercial leased properties and multifamily housing.
- **Upfront capital constraints:** Many high-impact efficiency measures require significant initial investment, even when lifecycle economics and payback periods remain favorable. Smaller businesses and lower-income customers often face additional financing barriers that limit participation.

[22] For purposes of this report, the "economic case" for energy efficiency refers to the combined value of customer bill savings, avoided energy consumption, avoided or deferred peak-related system costs, improved reliability during constrained grid conditions and the comparatively low cost of saved energy. This report does not assign a single dollar value to each MW of peak demand reduction because that value depends on when and where the reduction occurs, which customer class delivers it, and which generation, transmission, distribution, or reliability costs are avoided.

- **Awareness and information gaps:** Customers frequently lack actionable information regarding which efficiency measures provide the greatest potential for savings, how available incentive programs operate, or how to identify qualified contractors and vendors. This challenge can be heightened in the ERCOT market because the utility administering the EE program may not be the entity with the most frequent customer-facing retail relationship. CenterPoint has noted that customer awareness remains a major participation barrier, with recent baseline survey results indicating that only 40% of customers were aware that CenterPoint provides energy efficiency programs.
- **TDU-REP program delivery gaps:** Texas's competitive retail structure creates a conundrum for EE implementation. TDUs are responsible for delivering regulated EE programs and achieving savings goals, while REPs often manage the primary customer relationship and billing experience. However, REPs may not proactively market utility-administered EE programs or pass through value-added incentives to customers at the scale needed to drive broad participation. This gap can reduce the effectiveness of available incentives, particularly when customers are unclear whether the utility, REP, contractor or another provider is responsible for program information, enrollment and incentive delivery.
- **Contractor and workforce capacity:** The skilled workforce required to design, install, commission, and maintain efficiency upgrades at scale remains limited in several sectors, particularly as demand for electricians, HVAC technicians, and industrial energy specialists continues to increase across the broader energy transition economy.
- **Program design limitations:** Prescriptive rebate structures may not fully capture the value of comprehensive retrofit projects, industrial process optimization, or integrated building management strategies that require customized engineering approaches. In addition, programs that rely heavily on third-party delivery partners may face uneven marketing, inconsistent customer engagement, or limited ability to target high-value opportunities without stronger coordination across market participants.
- **Misaligned regulatory and market incentives:** While Texas utilities are required and incentivized to achieve energy and demand savings through regulated EE programs, the broader market structure does not always align every participant around the same outcome. TDUs may administer programs, REPs may control key customer touchpoints, and customers may focus primarily on upfront costs, payback or operational risk. This fragmentation can reduce long-term investment certainty and slow broader market adoption of advanced efficiency technologies.
- **Voluntary participation structure:** Most existing EE programs depend on voluntary customer enrollment and incentive uptake rather than mandatory efficiency standards or building performance requirements. As a result, participation rates often remain below economically achievable potential, particularly in rapidly growing commercial and industrial sectors.
- **Energy code updates:** Most state-level energy codes are at least a decade old, with some more recent local energy code updates. Recent state-level energy code proposals may not fully address important needs for the Houston region specifically. This results in limited knowledge and engagement among regional stakeholders and makes it more difficult to align on important updates that address localized issues.
- **Flexibility ecosystem:** ERCOT lacks a mature customer-side flexibility ecosystem. In ERCOT's competitive retail market utilities, REPs, aggregators, technology providers, installers and customers each influence different parts of the customer experience but roles are not always clearly defined. This creates uncertainty around who should educate customers, set equipment capability preferences, provide incentives, enroll devices, and coordinate dispatch. Without clear program design and market coordination, equipment replacement decisions made today may not preserve future flexibility value for the grid.

Addressing these barriers will require coordinated action across utilities, regulators, policymakers, customers, REPs, contractors, aggregators and private-sector market participants. Expanding program flexibility, increasing customer awareness, strengthening workforce development pipelines, modernizing incentive structures, improving coordination between TDUs and REPs, and aligning efficiency goals with broader grid reliability and economic development objectives can help EE resources scale alongside planned investments in generation and transmission infrastructure.

DEMAND RESPONSE: GRID FLEXIBILITY AND RELIABILITY VALUE

For the Houston region's growing industrial base, participation in demand response programs at scale represents both a significant revenue opportunity and a direct contribution to regional grid reliability. Demand response in Texas operates through multiple, complementary pathways. These include utility-funded load management programs administered through regulated energy efficiency portfolios, ERCOT wholesale market products that compensate qualified load resources for reliability and ancillary service value, and MISO Texas demand response structures that are more closely tied to resource adequacy, capacity accreditation, and emergency operations. ERCOT and MISO Texas take meaningfully different approaches to demand-side resources, shaped by their distinct market structures, resource adequacy frameworks, and regulatory histories. This section presents results from both market structures, with methodological distinctions noted where relevant.

ERCOT DEMAND RESPONSE MARKET STRUCTURE

ERCOT operates as an energy-only market without a traditional capacity market, placing a premium on resources capable of responding quickly and reliably to system conditions. Demand response is among the most flexible and cost-effective resources available in this structure, with the ERCOT market rewarding flexibility through scarcity arbitrage, ancillary services payments, and 4CP cost avoidance. Load resources (LR) or controllable load resources (CLR) can participate in the same ancillary service markets as generators through a Qualified Scheduling Entity (QSE), in which their load reduction is treated equivalently to an increase in generation in the market.

ERCOT procures ancillary services primarily in the Day-Ahead Market (DAM) to maintain grid reliability and frequency stability and deploys them in real time when needed. Industrial facilities, data centers, or aggregated loads must first register as LR or CLR, meeting telemetry, response speed, and verification requirements. All market resources must be represented by a QSE which submits the bids or offers (energy offers, ancillary service capacity offers) into ERCOT day-ahead markets. ERCOT co-optimizes these offers to meet reliability requirements at the least cost. If ERCOT awards ancillary service capacity to a load participant, the participant must reserve curtailment capacity for that service. When triggered by a frequency event or reserve shortage, the load automatically or manually curtails.

Responsive Reserve Service (RRS) is designed to respond rapidly to sudden generation outages or major frequency deviations. ERCOT historically relied on synchronized thermal generation for RRS, but the market has shifted significantly. Provision of RRS is currently dominated by Energy Storage Resources (ESRs), especially batteries, and Non-Controllable Load Resources (NCLRs), large interruptible loads that can automatically curtail consumption during under-frequency events. The shift toward ESRs and NCLRs reflects increasing battery deployment in Texas, retirement or reduced flexibility of older thermal assets, and ERCOT's need for faster response products as renewable penetration grows.

ERCOT's Contingency Reserve Service (ECRS) was introduced in 2023 to address reliability needs associated with higher renewable penetration, reduced system inertia, large net-load ramps, and forecast uncertainty. ECRS bridges the gap between fast response reserves, such as RRS, and slower reserves, such as Non-Spinning Reserve Services (NSRS), and is designed to provide dispatchable ramping capability within approximately 10-30 minutes. ECRS is supplied by a combination of Energy Storage Resources (ESRs), primarily batteries, and Non-Spinning Reserve Services (NSRS), primarily gas peakers. Batteries are well suited for ramping instantly, dispatching repeatedly, and providing operational flexibility, however ECRS duration requirements constrain their participation and result in gas peakers remaining important as a backup reserve product during conditions of tight reserves, high renewable variability, evening ramps, and extreme weather. ERCOT significantly increased NSRS procurement volumes in 2022 after Winter Storm Uri and broader reliability reforms.

ERCOT's ancillary service markets are evolving toward a complementary structure with batteries dominating ultra-fast, precision-based services (RRS, regulation), gas peakers remaining essential for sustained reserve capability (NSRS and portions of ECRS), NCLRs continuing to provide highly cost-effective fast load-shed capability, and ECRS serving as the transitional product balancing fast response and duration needs. Since 2018, the NCLR demand response registered capability pool has grown from ~3,500 MW to more than 10,000 MW[23], driven by post-Uri market reforms, data center and crypto growth, and the launch of new ancillary products. This growing NCLR pool represents broad theoretical flexibility for large industrial loads, but currently does not function as fully dispatchable grid capacity with actual response deployments and ancillary market clears in the range of 1,800 MW to 2,500 MW[24] for 2024.

According to FERC's 2025 assessment, ERCOT experienced the largest net annual increase in wholesale demand response resources among organized electricity markets. ERCOT wholesale demand response participation increased from approximately 3,613 MW in 2023 to 4,099 MW[25] in 2024, representing an increase of approximately 468 MW, or 13.5%, and accounting for roughly 4.8% of ERCOT peak demand. FERC also reports product-level changes across ERCOT's demand response participation pathways, including increases of approximately 286 MW in Emergency Response Service (ERS), 299 MW in ERCOT Contingency Reserve Service (ECRS), and 215 MW in Non-Spinning Reserve Service (NSRS), alongside a decrease of approximately 279 MW in Responsive Reserve Service (RRS). These product-level changes should be interpreted as shifts in participation across ERCOT demand response market products rather than as additive resource categories to be summed separately from the 4,099 MW total.

[23] Potomac Economics, 2024 State of the Market Report for the ERCOT Electricity Markets, May 2025.
[24] Potomac Economics, 2024 State of the Market Report for the ERCOT Electricity Markets, May 2025.
[25] Federal Energy Regulatory Commission (FERC), *Assessment of Demand Response and Advanced Metering, Office of Energy Policy and Innovation, 2025.*

RELIABILITY LAYER	ERCOT PROGRAM STRUCTURE	RESPONSE TIME	PURPOSE	TYPICAL RESOURCES
Strategic emergency reserves	Emergency Response Services (ERS)	10 – 30 minutes	Emergency-only reliability backstop	Industrial loads, aggregated C&I loads
Economic / price-responsive DR	Load Resources (LR) / Controllable Load Resources (CLR)	Real-time to minutes	Reduce load during scarcity or high-price conditions	Industrial loads, flexible commercial loads
Ancillary Services	Responsive Reserve Service (RRS) / ERCOT Contingency Reserve Service (ECRS) / Non-Spinning Reserve Service (NSRS)	Seconds to 30 minutes	Continuous operating reserves and frequency control	ESRs (batteries), industrial loads, data centers
Utility-Funded Load Management	Utility-administered DR / load management programs	Minutes to hours	Peak reduction, local system support and customer-side load flexibility	Residential, small commercial, municipal, multifamily, schools, aggregated C&I loads
Emerging distributed DR	Residential Demand Response (RDR)	Minutes to hours	Peak shaving and load shaping	Smart thermostats, EVs, home batteries

Exhibit 11. Demand response program structure and layered reliability framework for the ERCOT market.

UTILITY-FUNDED DEMAND RESPONSE AND LOAD MANAGEMENT PROGRAMS

In addition to wholesale and capacity market demand response resources, Texas utilities support utility-funded load management and demand response programs that help reduce peak demand and manage local system needs. These programs are commonly administered through utility energy efficiency portfolios and may provide incentives to customers, contractors or third-party sponsors that can deliver verified load reductions during peak demand periods or utility-called events. Unlike permanent energy efficiency measures, utility-funded DR programs generally do not reduce electricity consumption continuously throughout the year. Instead, they provide dispatchable, event-based demand reductions that can help reduce system peaks, mitigate local distribution constraints, and support grid reliability during high-load conditions.

Utility-funded DR programs are particularly important because they can reach customer segments that may not directly participate in ERCOT wholesale market products. Commercial buildings, multifamily properties, municipal facilities, schools, small businesses, and residential customers may be able to participate through utility load management programs, contractors, aggregators, or technology-enabled devices without registering directly as wholesale market participants. These programs therefore complement ERCOT-administered Emergency Response Service, Load Resource and Controllable Load Resource participation, and emerging distributed flexibility options by expanding the pool of customers capable of providing demand reductions.

MISO TEXAS DEMAND RESPONSE MARKET STRUCTURE

MISO Texas has a demand response (DR) structure that is similar in purpose to ERCOT's layered reliability framework, but the market architecture is fundamentally different with MISO's centralized capacity market framework creating different incentives and program structures for demand response participation. In the MISO Texas footprint, demand response contributes through an annual Planning Resource Auction (PRA) and North American Electric Reliability Corporation (NERC)-based reliability standards. As a result, MISO's DR stack is generally more capacity-oriented, utility-administered, and emergency-focused and less real-time economically optimized than ERCOT.

The MISO Texas DR framework evolves downward from planning reserve adequacy toward operational dispatchability, in contrast to the ERCOT DR framework that evolves upward from price-responsive flexibility toward real-time ancillary optimization. In MISO Texas demand response (DR) is primarily treated as a resource adequacy and emergency reliability resource, which shapes program design, revenue streams, dispatch frequency, telemetry requirements, ancillary services participation, and aggregator economics.

FERC's latest assessment estimates MISO demand response resource capability at 12,954 MW in PY2024 (approximately 10.6% of peak demand), with approximately 700 MW estimated in the MISO Texas footprint[26]. The PY2024 estimates show a 2.3% increase in demand response resource participation from PY2023 across MISO.

[26] Federal Energy Regulatory Commission (FERC), Assessment of Demand Response and Advanced Metering, Office of Energy Policy and Innovation, 2025.

RELIABILITY LAYER	MISO TEXAS PROGRAM STRUCTURE	PURPOSE	PRIMARY USE	ERCOT ANALOG / TYPICAL RESOURCES
Planning reserve adequacy	Load Modifying Resources (LMRs)	Primary DR construct for planning reserve adequacy and capacity accreditation	Planning reserve margins, capacity accreditation, and emergency reliability support	ERS + capacity-style DR / industrial loads, aggregated C&I portfolios
Emergency operations	Emergency Demand Response (EDR)	Emergency operating program activated during system reliability events	Capacity emergencies, Energy Emergency Alerts (EEAs), extreme weather events, resource adequacy shortfalls	ERS
Economic dispatch	Demand Response Resources (DRR) Type I / II (Capacity Market Participation)	MISO DRRs can participate in energy markets, reserve markets, and dispatchable operations	DRR Type I: spinning and supplemental reserves (if qualified); DRR Type II: can be continuously dispatched, behave more like generation assets, support ancillary services	LR / CLR
Fully dispatchable + fast ancillary services (AS)	Demand Response Resources (DRR) Type II + Operating Reserves	MISO allows qualified DR resources to provide regulation reserves, spinning reserves, supplemental reserves, and ramp capability products	Limited participation: AS market design more focused on generation than DR and capacity accreditation more important than real-time reserve monetization	RRS / ECRS participation / smaller, less mature and less load-dominated than ERCOT
Emerging residential / distributed energy resources	Utility VPP pilots / aggregators	Aggregation of emerging Distributed Energy Resources (DER)	Drivers: DER aggregation, smart thermostats, managed EV charging, utility peak reduction programs	Proposed RDR / emerging similarly to ERCOT but progress is slower
Locational grid optimization resource	Transmission Constraint Management	DR assets located at or near constrained nodes can provide targeted congestion relief more efficiently than imports from outside constrained areas	Nodal market with Locational Marginal Prices (LMPs): relieve localized transmission congestion, lower congestion costs, improve deliverability and reliability	Large industrial loads, AI / data centers

Exhibit 12. Demand response program structure and reliability framework in the MISO Texas market.

MULTIDIMENSIONAL VALUE OF DEMAND RESPONSE

The value of demand response extends beyond the direct cost of curtailed energy. In both ERCOT and MISO Texas markets, demand flexibility contributes to system reliability and market efficiency across several overlapping dimensions:

- Helps meet peak demand and maintain planning reserve margins
- Provides fast-ramping operating reserves and frequency regulation services that help manage variability of wind and solar output
- Relieves transmission congestion at specific nodes by reducing peak flows on constrained assets
- Serves as a critical reliability tool during emergencies or system stress conditions

Registered demand response reflects resources currently enrolled in utility programs or wholesale market participation pathways. Latent flexible load includes customers that are not currently registered as DR resources but may be able to modify operations under appropriate commercial, regulatory, or market structures. The large-load implications of this distinction are addressed later in the report.

Additionally, the growing penetration of distributed energy resources, smart thermostats, and industrial automation is gradually blurring the line between traditional curtailment-based demand response and continuous load flexibility. ERCOT and MISO Texas are both working to accommodate this shift into their market rules.

DATA CENTER FLEXIBILITY: A NEXT-GENERATION FLEXIBLE LOAD RESOURCE

As Houston and Texas continue to attract hyperscale and AI-focused facilities, integrating both efficiency standards and flexible load strategies into data center development will become increasingly important to maintaining reliability, moderating infrastructure costs, and supporting long-term economic competitiveness. As stated earlier in the EE section, data center efficiency and data center flexibility are treated separately in this report because they create different types of grid value. The previous data center section focused on durable efficiency opportunities. This section focuses on a separate but complementary question: how data centers may provide operational flexibility during constrained grid conditions.

Many modern data centers possess growing potential to provide flexible load capabilities that can support grid reliability during periods of peak demand or system stress. While some computing operations require continuous uptime, operators can increasingly shift or defer non-time-sensitive workloads, stagger AI training cycles, temporarily reduce computing intensity, optimize cooling loads, or use on-site backup systems during constrained grid conditions. Advanced energy management systems may also allow operators to dynamically adjust cooling and server utilization in response to operational needs, market signals or grid emergencies.

Current utility DR programs were originally designed around industrial curtailment, commercial HVAC load reduction, and other traditional load management strategies. Data center load flexibility represents an evolution of these models, combining conventional curtailment with workload management, cooling optimization, advanced controls and customer-side energy resources. However, under current ERCOT and PUCT rules, not all flexibility tools are available through utility-administered EE or DR programs. Batteries, virtual power plants (VPPs), broad aggregation models, time-of-use-rates, interruptible service structures, and large-load flexibility arrangements may provide grid value, but their eligibility and compensation depend on the specific pathway: utility load management programs, ERCOT wholesale participation through a QSE, REP or aggregator offerings, customer-specific commercial agreements, or future regulatory and market design changes.

For Houston, the strategic opportunity is to distinguish between continuous mission-critical loads, flexible computing or cooling loads, and on-site resources that support resilience or market participation. A clearer framework for recognizing and valuing these differences would help preserve reliability, reduce infrastructure pressure, and support economic development without overstating the tools currently available under ERCOT's utility program structure.

RATEPAYER AFFORDABILITY AND ECONOMIC COMPETITIVENESS

Energy efficiency (EE) and demand response (DR) are not solely grid management instruments; they are fundamental drivers of electricity affordability and long-term economic competitiveness for residential, commercial, and industrial customers across the Houston region. The mechanisms through which EE and DR reduce ratepayer costs include:

- Direct bill savings for participating customers through reduced electricity consumption and, where applicable, lower peak demand charges.
- System-wide cost reductions through moderated investment in generation, transmission, and distribution infrastructure.
- Lower wholesale energy prices during peak periods due to reduced demand pressure on the market.
- Reduced reliance on high-cost peaking resources and scarcity pricing events during extreme weather and peak demand periods.
- Improved utilization of existing grid infrastructure by reducing or shifting load during high-cost, high-stress hours.

PUCT advanced metering infrastructure (AMI)-based consumption analyses evaluate interval usage data before and after participation in utility-administered efficiency programs to measure realized energy savings and persistence over time. PUCT evaluations consistently show that IOU residential retrofit programs deliver measurable and sustained reductions in customer electricity consumption. PUCT AMI-based consumption analyses indicate that Residential Standard Offer Program

(SOP) participants reduced annual electricity consumption by an average of approximately 9.6%, corresponding to average annual bill savings of about $263 per participating household[27].

At the portfolio level, the cost of saved energy in Texas IOU efficiency programs remains competitive with national benchmarks and substantially below the cost of new generation resources. EE therefore functions as a least-cost system resource in which total system and customer benefits can exceed program administrative costs and participant incentive expenditures. These avoided costs include reduced fuel consumption, avoided capacity needs, lower transmission and distribution system costs, and mitigation of peak-period wholesale price volatility.

The affordability case for EE and DR strengthens as regional electricity demand and weather-driven peak load growth accelerates. Sustained deployment of demand-side resources can help moderate the scale and timing of future supply-side and grid infrastructure investment, reducing upward pressure on customer costs while improving overall system flexibility and resilience. At the same time, continued investment in generation, transmission, and distribution infrastructure will remain necessary to support reliability and long-term growth.

In ERCOT, the affordability value of EE and DR must be understood within Texas's competitive market structure. TDUs administer regulated EE programs, while ERCOT market participation, REP offerings, customer investments, and transmission planning operate through separate channels. As a result, EE and DR should be evaluated as demand-side complements to generation and transmission investment, not as substitutes for integrated utility resource planning. Material expansion of utility-administered programs may require changes to applicable law, regulation, cost recovery, or approved program budgets.

UPCOMING RESIDENTIAL REBATE PROGRAMS

In addition to utility-administered energy efficiency programs, Texas residential customers may soon have access to new federally funded home energy rebate programs administered by the State Energy Conservation Office (SECO). The Inflation Reduction Act (IRA) authorized two major residential rebate programs: the Home Efficiency Rebates Program (HOMES) and the Home Electrification and Appliance Rebate Program (HEAR). SECO is currently designing the Texas HOMES and HEAR programs with funding allocated by the U.S. Department of Energy (DOE). As of SECO's latest program update, rebates are not yet available, and a future launch date will be established once the state receives DOE approval.[28]

These programs could become an important near-term tool for improving residential affordability and reducing energy consumption in the Houston region. The HOMES program is expected to support comprehensive, whole-home energy saving upgrades, including improvements that reduce overall household energy use. The HEAR program is expected to support income-qualified households in replacing older equipment with efficient electric appliances and related enabling upgrades. Together, these programs can help reduce upfront cost barriers for residential customers, support equipment replacement and envelope improvements, and complement existing utility-administered efficiency programs.

Because the programs remain in design and approval, this report treats SECO-administered IRA home rebates as an emerging implementation pathway rather than an active program currently available to customers. Once launched, these rebates could help expand the pool of residential customers able to afford high-efficiency HVAC equipment and other measures that reduce household energy consumption and monthly energy costs.

It is also important to distinguish between different DR pathways. Utility-funded DR and load management programs can provide meaningful affordability and reliability benefits, particularly for residential customers, commercial customers, and aggregated portfolios that may not participate directly in ERCOT wholesale markets. These programs can help reduce peak demand, support local system needs, and broaden access to customer-side savings opportunities. However, current utility program structures may not allow IOUs to directly incentivize all forms of industrial-scale DR or large-load flexibility. For large industrial customers and other types of large loads, further DR expansion may depend more heavily on ERCOT market participation, qualified scheduling entities, aggregators, retail electric providers, or customer-specific commercial arrangements rather than utility EE program funding alone.

INTERSECTION OF LARGE LOAD GROWTH WITH ENERGY EFFICIENCY AND DEMAND RESPONSE

ERCOT is continuing to track substantial large-load interconnection interest, generally defined as facilities requesting 75 MW or more of interconnection[29] capacity. As of April 2026, ERCOT reported approximately 410 GW of large-load requests seeking interconnection , up from roughly 230 GW reported in late 2025. While a significant portion of this pipeline remains in early planning stages and may not ultimately materialize, the scale and continued growth of these requests create important planning implications for generation, transmission, distribution infrastructure and customer-side flexibility. This trend reinforces the importance of evaluating energy efficiency and demand response as complementary tools that can help moderate peak demand impacts, improve the reliability profile of new load additions, and support more efficient integration of economically valuable projects.

For Houston's industrial base, electricity costs represent a significant component of total operating expenses. Programs that enable industrial customers to manage load through efficiency improvements, demand response participation, or on-site generation directly enhance regional economic competitiveness and support job retention and growth.

Large-load flexibility represents an important but underdeveloped resource for managing Texas' next phase of electricity demand growth. Data centers, AI compute facilities, industrial production,

[27] Tetra Tech and Public Utility Commission of Texas (PUCT), Program Year 2023 Investor-Owned Utilities Energy Efficiency Portfolio Report, Volume 1, Section 1.4 "AMI-Measured Average Annual Energy Savings for Residential Retrofit Programs, November 2024.
[28] Texas State Energy Conservation Office (SECO), Inflation Reduction Act (IRA) Home Energy Rebates (HOMES and HEAR) program webpage, accessed 2026.
[29] Electric Reliability Council of Texas (ERCOT), *Update to the Senate Committee on Business & Commerce*, April 1, 2026.

advanced manufacturing, and other large-load customers are often evaluated based on peak demand requirements, but their operational flexibility can vary significantly. Some loads may be able to reduce demand during scarcity hours, shift non-urgent operations, rely on on-site backup or co-located generation, or accept differentiated service terms in exchange for lower energy costs or faster grid integration. For these customers, demand response should be considered part of the project development and interconnection strategy. Flexible large loads can help reduce the amount of firm grid capacity required during peak or constrained hours, improve the reliability profile of new load additions, and create a pathway for economic growth.

For fast-growing sectors such as data centers and industrial electrification, the latent flexibility opportunity may be significant because some loads can shift non-critical operations, respond to scarcity pricing, use on-site resources, or accept interruptible service structures. Demand response can become a screening and acceleration tool for large-load growth.

POLICY AND LEGISLATIVE DEVELOPMENTS

Recent legislative and regulatory actions are increasingly linking large-load interconnection, transmission planning, energy waste reduction and demand flexibility in Texas[30]:

House Bill 5066, 88th Texas Legislature, Regular Session (2023):

amended transmission planning and certificate of convenience and necessity review requirements for areas with rapid load growth. Among other changes, HB 5066 requires consideration of historical load, forecasted load growth, and additional load currently seeking interconnection, including load for which an interconnection agreement has not yet been signed.

Senate Bill 6 (SB 6), 89th Texas Legislature, Regular Session (2025):

addresses planning for, interconnection and operation of, and cost recovery related to providing service for certain large electrical loads. The legislation includes provisions related to large-load interconnection standards, interconnection cost recovery, study fees, disclosure of similar service requests, backup generation information, and curtailment or backup generation protocols under defined emergency conditions.

House Bill 5323, 89th Texas Legislature, Regular Session (2025):

created the Texas Energy Waste Advisory Committee to make recommendations for coordinating and improving state agency and interagency programs that reduce energy waste, increase energy efficiency, and enhance demand response programs in order to increase reliability of electric service in the ERCOT power region.

Together, these developments are beginning to redefine economic development readiness in Texas. Future large loads may increasingly benefit from demonstrating curtailment capability, behind-the-meter resilience, or active participation in demand management pathways. For the Houston region, the near-term opportunity is to apply EE and DR to reduce the time and cost to connect new loads, particularly where distribution, substation or transmission constraints are the binding interconnection challenge.

SECTOR-SPECIFIC INTERSECTION OPPORTUNITIES

- **Data Centers:** Efficiency and flexibility strategies can reduce the firm grid capacity required for a given level of computing output where measures deliver verifiable savings or operational flexibility. These opportunities are most valuable when identified early in site selection, interconnection, and service-planning discussions, subject to the current-state market and program limitations discussed above.
- **Industrial and Large Commercial Facilities:** Large customers can combine persistent efficiency improvements with dispatchable flexibility where operationally feasible, using either utility program channels or wholesale market pathways depending on eligibility, telemetry, and performance requirements.
- **Large Multi-Family Residential and Mixed-Use Developments:** can function as significant aggregated loads even when demand is distributed across many individual meters; persistent EE opportunities include high-efficiency HVAC and water heating, building envelope improvements, efficient lighting, appliances, common-area controls, and optimized ventilation; load flexibility opportunities include smart thermostats, grid-interactive variable speed HVAC systems, managed EV charging, battery storage, common-area load controls, and building energy management systems that aggregate smaller residential and commercial loads into a coordinated dispatchable resource.
- **Advanced Manufacturing:** like data centers, new manufacturing expansions can be designed with grid-interactive controls enabling rapid load reduction during constrained hours with minimal product disruption.

[30] Because Texas bill numbers repeat across legislative sessions, this report identifies each cited bill by bill number, legislature, session, year and subject to avoid ambiguity.

EMERGING TECHNOLOGIES: BEHIND-THE-METER SOLAR, STORAGE, AND CUSTOMER-SIDE ENERGY MANAGEMENT

Behind-the-meter (BTM) solar-plus-storage can complement EE and DR, but they should not be treated as interchangeable with traditional efficiency. Solar can reduce net grid purchases during production hours, while storage can shift demand, support resilience, or provide dispatchable flexibility where market and program rules allow. Neither resource automatically produces permanent energy savings in the same way as equipment efficiency, building improvements, or operational optimization.

For commercial and industrial customers in the Houston region, BTM solar-plus-storage systems can serve several customer value streams, including:

- Reducing net grid purchases during solar production hours
- Increasing flexible electricity use and charging batteries during lower-cost or less-constrained hours, and discharging stored energy during peak or grid-constrained periods
- Providing backup power and resilience
- Supporting grid services where aggregation or market participation pathways are available

Because BTM solar, storage and aggregation sit at the intersection of customer investment, utility programs, retail offerings and ERCOT market rules, their treatment requires careful distinction between what is available today and what may become possible through future market or regulatory changes.

The declining cost trajectory of solar photovoltaic (PV) panels and lithium-ion battery storage has improved the economics of BTM systems, particularly for customers with significant daytime electricity demand, resilience needs, or corporate energy goals. Federal investment tax incentives may further improve project economics for eligible customers, although availability depends on project type, ownership structure, construction timing, place-in-service dates, and evolving federal tax-law requirements.

BTM solar, storage and customer-side energy management technologies can also create future flexibility value when paired with advanced controls, telemetry, aggregation platforms, or market participation pathways. In ERCOT, aggregated distributed energy resource participation is advancing through wholesale market processes such as the Aggregated Distributed Energy Resource (ADER) pilot and related market-design discussions. These developments indicate growing interest in virtual power plant style models and aggregated customer-side resources as grid assets.

At the same time, these emerging pathways should be distinguished from current utility-administered energy efficiency programs. Under current ERCOT and PUCT utility program structures, transmission and distribution utilities do not have broad authority to offer utility-run virtual power plant or aggregation frameworks as part of their regulated EE portfolios. Battery storage is also not generally treated as an eligible energy efficiency measure in the same way as traditional load-reducing technologies such as HVAC upgrades, controls, lighting, building envelope improvements, or process optimization.

As a result, this report treats BTM solar-plus-storage as important complementary customer-side resources rather than as direct substitutes for traditional energy efficiency. Their near-term value is strongest where they reduce net grid purchases, improve resilience, support customer cost management, or enable verified flexibility through appropriate ERCOT, REP, aggregator, utility load management, or bilateral commercial pathways. Over time, regulatory and market-design changes could expand the role these technologies play in demand response, aggregation, and localized grid support.

FINANCING AND BUSINESS MODELS FOR EFFICIENCY INVESTMENT

Capital availability and financing structures are among the most consequential determinants of whether cost-effective energy efficiency measures are ultimately deployed. Houston's commercial and industrial (C&I) customers typically encounter three primary implementation frictions: capital constraints or competing capital priorities, split incentives between owners and tenants, and uncertain payback acceptance thresholds. The most effective financing models are those that align repayment with realized savings or asset value enhancement.

FINANCING MODEL	HOW IT WORKS	STRENGTHS	CONSTRAINTS & RISKS	HOUSTON APPLICATIONS
Energy Savings Performance Contract (ESPC / EPC) & Energy Service Company (ESCO)-led Delivery	Contractor designs, installs and guarantees energy conservation measure performance; financing is typically arranged by the contractor and repaid from verified savings	Budget-neutral pathway, transfers performance risk to contractor, bundles multiple measures	Requires robust baseline M&V and contract sophistication, works best for sizable, multi-measure projects	Large campuses (healthcare, universities, municipal facilities), industrial sites with multiple energy conservation measures (ECMs)
Commercial Property Assessed Clean Energy (C-PACE / Texas PACE)	Low-cost, long-term financing for water & energy improvements, repaid as a property assessment, enabled by Texas law	Long amortization can make deep retrofits cash-flow positive from day one, transferable with property sale	Requires local program availability & lender consent, best for owner-occupied or long-hold assets	Commercial real estate retrofits, resilient redevelopment projects, industrial owner-occupied properties
Utility Standard Offer Programs (SOPs) & Market Transformation Programs (MTPs)	Utility incentives & technical support for qualifying measures and projects	Reduces project cost, streamlines contractor ecosystem, savings validated through standardized technical reference manual (TRM) methods	Incentive levels & timelines can limit deep retrofits, may not fully resolve capital constraints	"First fuel" projects for small / medium C&I, HVAC controls, lighting + controls, targeted process upgrades
Federal Tax Incentive Programs (179D / ITC)	Building owners may claim deductions for qualifying energy efficient commercial building property, enhanced deductions possible based on savings and labor requirements	Material after-tax cost reductions, can be layered with other financing structures to create stacked incentive packages	Requires sufficient tax appetite, compliance documentation, and careful verification of project eligibility based on technology scope, performance criteria, and labor requirements	Owner-occupied or taxable commercial real estate (CRE) projects with significant lighting, HVAC, envelope scope
Aggregator / Market Participation Model	Loads monetize flexibility through wholesale energy & ancillary services or emergency programs via third-party aggregator	Creates recurring revenue stream, can improve project IRR for controls / automation, aligns with reliability	Requires telemetry infrastructure, operational discipline, managing performance risk	Large industrial loads, flexible processes, data centers with controllable non-critical load
Energy-as-a-Service (EaaS) / Managed Efficiency + Flexibility	Third party installs & operates efficiency & flexible load assets, customer pays performance-based service fee	Minimizes upfront capex, integrates EE + DR as a single managed solution	Contract complexity, counterparty risk, potential for measurement disputes	Sites needing rapid deployment, warehouses, refineries / chemical plants, critical facilities seeking resilience
On-Bill Financing & Green Tariffs	Customers finance efficiency improvements through their utility bill, repaying the investment over time from energy savings; green tariffs provide access to renewable energy procurement	Eliminates the need for upfront capital, aligns repayment directly with investment-generated savings	Program availability varies by utility territory and customer class	Large C&I customers accessing renewable energy alongside efficiency investments

Exhibit 13. Efficiency financing and business models for Houston commercial and industrial customers.

IMPLEMENTATION ENABLERS FOR SCALING CUSTOMER SAVINGS

The highest-leverage enablers for scaling customer savings in the Houston region without compromising reliability include:

- **Measurement and verification (M&V) modernization:** Houston's electric system has traditionally relied on static forecasting and assumption-based energy efficiency tracking rather than real-time validation of demand-side performance. As demand-side resources become more important to reliability and affordability, performance-based EE and flexible load programs will require advanced metering, automated analytics, standardized telemetry, and credible verification systems capable of proving reliable load reductions during critical grid conditions. The challenge is heightened by the operational complexity of industrial facilities, the need for customer trust around data sharing and cybersecurity, and the importance of ensuring these resources can deliver dependable reliability value amid Houston's rapid load growth and extreme weather risks.
- **Aggregation and device enablement:** Aggregation can combine smaller flexible loads such as smart thermostats, water heaters, high-efficiency HVAC systems, EV chargers, building controls, and certain industrial controls, into coordinated resources that respond to grid needs.

Program designs should send clear signals about preferred equipment capabilities, including efficiency, communication capabilities, inter-operability, and controllable load flexibility, so devices installed today can support future DR or aggregation programs where market rules allow.

- **Targeting constrained hours and locations:** The value of load flexibility is highest during peak net load hours and in transmission- or distribution-constrained areas. Near-term programs can prioritize eligible customers and dispatchable reductions during critical intervals or in constrained corridors where current rules allow.

Over time, policymakers and regulators could consider whether program rules should better recognize locational and temporal value.

- **Utility-funded DR program alignment:** Utility-funded load management programs can broaden residential and commercial participation, while large industrial and other large-load flexibility may depend more heavily on ERCOT market products, QSEs, aggregators, REPs, or bilateral agreements. Clearer alignment across these pathways would reduce confusion around recruitment, incentives, dispatch coordination, and verification.
- **Institutional coordination:** Many of the barriers to broader EE and DR adoption are regulatory, operational, and organizational rather than purely technical. The Public Utility Commission of Texas's (PUCT) Energy Waste Advisory Committee, established under House Bill 5323, creates an important statewide platform for aligning utilities, regulators, market participants, customers, and other stakeholders around strategies to reduce energy waste, expand EE programs, and strengthen DR as a reliability resource. For the Houston region, this committee provides an opportunity to improve program design, streamline participation requirements, modernize measurement and verification practices, and better coordinate incentives across utilities and market structures. Institutional coordination is especially important as Texas faces rapid load growth, increasing electrification, and heightened reliability risks from extreme weather, all of which require demand-side resources to play a larger and more integrated role in grid operations. By creating a formal mechanism for cross-sector collaboration and policy development, the advisory committee can help accelerate deployment of scalable, customer-friendly programs while ensuring that EE and DR initiatives are aligned with broader reliability, affordability, and market reform objectives.
- **Layering utility and state-administered residential incentives:** Upcoming SECO-administered IRA home energy rebate programs could provide an important complementary funding source for residential customers, particularly those replacing older equipment or pursuing whole-home envelope improvements. When coordinated with existing utility-administered efficiency programs, these rebates could help reduce upfront cost barriers, increase customer participation, and accelerate adoption of high-efficiency residential technologies. Program coordination will be important to ensure customers understand which rebates are available, how eligibility is determined, and how state-administered incentives interact with utility programs, contractor offerings, and other funding sources.

ENABLING CONDITIONS FOR SCALING EFFICIENCY & DEMAND RESPONSE

Based on this analysis, stakeholders across the Houston region can implement a range of near-term actions to reduce friction for EE and DR deployment at scale, treat efficiency and flexibility as strategic risk management tools, and build the institutional and market foundations needed to capture the full value of demand-side resources. The recommendations below distinguish between actions available under current program and market structures and opportunities that may require regulatory, tariff, or market-design changes.

FOR POLICYMAKERS, REGULATORS, AND CIVIC LEADERS

- **Encourage** economic development agreements for very large loads to include minimum efficiency design standards and curtailment / load flexibility readiness provisions, consistent with the emerging legislative trend toward large-load demand management
- **Support** the development, adoption, and market awareness of C-PACE and other innovative financing instruments to mobilize private capital for efficiency investment at scale
- **Utilize** the PUCT Energy Waste Advisory Committee process to advance Houston-relevant program design improvements: performance-based C&I program offerings, accelerated M&V protocols, and targeted deployment in constrained distribution corridors
- **Support** recurring statewide assessments of untapped energy efficiency, demand response, and distributed energy resource potential, including transparent comparisons of expected demand-side resource costs with comparable new generation and infrastructure alternatives
- **Consider** expanded program funding and participation targets for commercial and industrial customers, where untapped efficiency potential is greatest and cost-effectiveness is strongest
- **Ensure** that demand response resources are appropriately valued and compensated within both ERCOT and MISO market structures, commensurate with their full reliability and system value
- **Maintain** and strengthen the regulatory foundations for utility-administered EE programs in both ERCOT and MISO Texas, including the PUCT Rule Section 25.181 cost-effectiveness framework and independent EM&V requirements
- **Plan** for aggregated demand in residential, multifamily and retail development with evaluation of large subdivisions, multifamily communities, master-planned developments, retail centers, small retail corridors, and real estate portfolios based on their combined load
- **As ERCOT and the PUCT** refine large-load interconnection processes beyond Batch Zero, policymakers and market stakeholders should consider mechanisms that recognize the reliability value of flexible load. Large-load customers that can commit to verifiable demand reductions, dispatchable curtailment, BTM generation, storage or differentiated operating profiles during constrained hours should be evaluated differently from fully inflexible loads. This approach could help Texas prioritize projects that contribute to economic growth while reducing peak demand impacts, transmission constraints, and reliability risks.

FOR UTILITIES

- **Prioritize** distribution planning processes that explicitly account for demand-side resource contributions to managing localized grid constraints, including both EE-driven load reduction and DR-based peak shaving
- **Expand** advanced metering and distribution-level data analytics to improve visibility into localized load dynamics and peak-period constraints to identify the highest value opportunities for targeted EE and DR deployments
- **Develop** program designs that engage large new loads, including data centers and industrial expansions, in demand response and efficiency from the initial interconnection stage, rather than after consumption patterns have been established
- **Clarify** utility roles in residential flexibility and help define the equipment capabilities, interoperability standards and incentive structures needed to build a more mature residential flexibility ecosystem in Texas.
- **Invest** in structured customer engagement and education initiatives to increase awareness of available efficiency programs, financing options, and demand management tools across all customer classes
- **Explore** partnerships with third-party aggregators and technology providers to expand geographic reach and program effectiveness of demand response offerings, particularly for smaller commercial and residential customers

FOR INDUSTRY AND LARGE COMMERCIAL CUSTOMERS

- **Prioritize** capital projects that simultaneously deliver energy savings and create dispatchable flexibility to stack economic value across EE, DR, and potential market revenue streams
- **Evaluate** demand response program participation as a revenue stream and a structural hedge against electricity price volatility, particularly during ERCOT scarcity events
- **ERCOT customers:** assess the feasibility of formal wholesale participation (Load Resource or CLR status) where operational readiness exists to capture market value comparable to generation

- **MISO Texas customers:** evaluate utility load management offerings for large sites to capture available incentives for demonstrated curtailable load capacity
- **Conduct** comprehensive energy audits to identify the full range of cost-effective efficiency opportunities, including measures eligible for federal investment tax credits and utility incentives

FOR RESIDENTIAL CUSTOMERS AND COMMUNITY ORGANIZATIONS

- **Expand** participation in high-performing residential EE programs, especially HVAC efficiency upgrades, smart thermostat deployment, and weatherization that have demonstrated annual bill savings for participants
- **Support** program designs that protect customer comfort and energy equity while enabling load aggregation to deliver meaningful residential demand response capacity as the residential DR market matures

CONCLUSION

Meeting Houston's near-term regional power demand requires a sustained, integrated commitment to both supply-side infrastructure and demand-side resources. Utilities, regulators, customers, and private investors must expand generation and transmission capacity while simultaneously scaling energy efficiency and demand response deployment that optimizes the timing, sizing, utilization, and cost-effectiveness of future infrastructure investment, lowers costs for ratepayers across all customer classes, and enhances the Houston region's long-term economic competitiveness.

Energy efficiency permanently reduces electricity consumption, lowering operating costs for businesses and households while easing structural pressure on a grid increasingly strained by rapid, broad-based load growth. Demand response complements these savings by providing the grid with a flexible, cost-effective tool for managing peak conditions and maintaining reliability during extreme weather events; conditions that may become more frequent and more consequential as demand grows.

Together, energy efficiency and demand response resources can help utilities optimize existing infrastructure, improve system resilience, and support a more reliable and affordable energy system. HETI looks forward to advancing this analysis, facilitating the stakeholder dialogue, and supporting the implementation of actions that will translate documented potential into quantifiable regional outcomes and a competitive energy future for Texas and the Houston region.

ABOUT HETI AND THE GREATER HOUSTON PARTNERSHIP

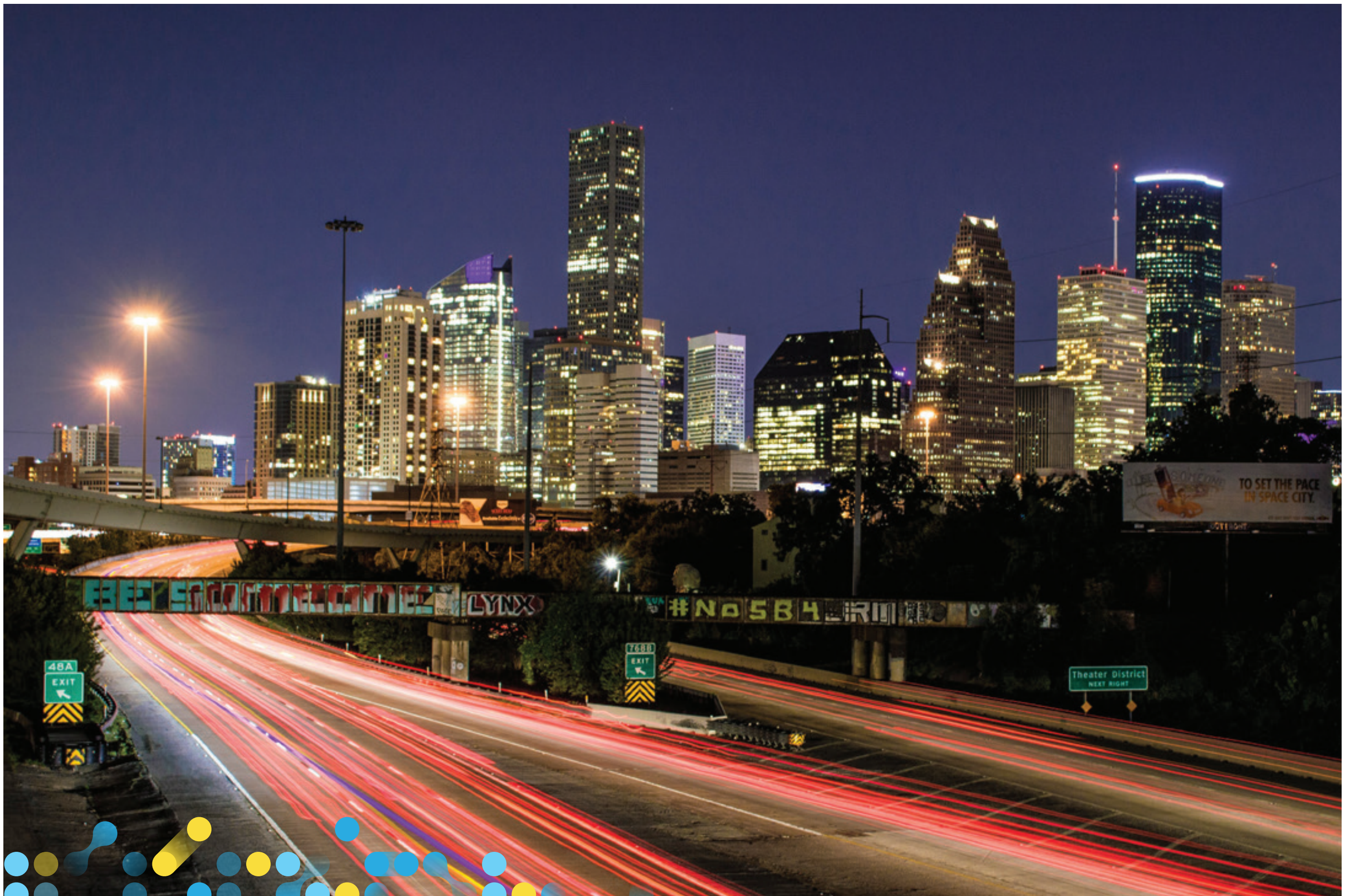
The Greater Houston Partnership, through its Houston Energy Transition Initiative (HETI), builds on the best of traditional energy skills and systems, leveraging industry leadership to accelerate global solutions for the dual challenge of producing more energy with lower emissions. The Partnership is the principal business organization for the greater Houston region, and HETI convenes industry, academia, government agencies and offices, nonprofits, and environmental nonprofits to collaborate on shared "more energy, lower emissions" challenges.

Through its Power Management Working Group, HETI brings together leaders and subject matter experts from industry, utilities, and key stakeholders to make Houston the most resilient and reliable power system in the nation, driving investment and creating economic opportunity for all. In early 2026, HETI launched this study on the role of efficiency and demand response to meet near-term power demand across the greater Houston region. The analysis was developed using a study-of-studies methodology, compiling existing research and publicly available data to provide a rigorous, fact-based analysis accessible to a broad stakeholder audience. Findings should be interpreted as order-of-magnitude estimates and directional insights grounded in current program data and publicly available market projections, not as precise forecasts or regulatory impact assessments.

APPENDIX 1: GLOSSARY OF TERMS

TERM	DEFINITION
ADER	Aggregated Distributed Energy Resource Pilot
AI	Artificial intelligence
AMI	Advanced metering infrastructure
BCR	Benefit-cost ratio
BTM	Behind-the-meter
C&I	Commercial and industrial
CLF	Conservation load factor
CLR	Controllable load resources
C-PACE	Commercial Property Assessed Clean Energy
CRE	Commercial real estate
DAM	Day-Ahead Market
DER	Distributed Energy Resource
DOE	United States Department of Energy
DR	Demand response
DRR	Demand response resources
DRRS	Dispatchable reliability reserve service
EaaS	Energy-as-a-Service
ECM	Energy conservation measures
ECRS	ERCOT Contingency Reserve Service
EDR	Emergency Demand Response
EE	Energy efficiency
EECRF	Energy Efficiency Cost Recovery Factor
EM&V	Evaluation, measurement, and verification
ERCOT	Electric Reliability Council of Texas
ERS	Emergency Response Services
ESCO	Energy Service Company
ESPC	Energy Savings Performance Contract
ESR	Energy Storage Resources
FERC	Federal Energy Regulatory Commission
HEAR	Home Electrification & Appliance Rebate Program
HETI	Houston Energy Transition Initiative
HOMES	Home Efficiency Rebates Program
HVAC	Heating, Ventilation, and Air Conditioning
IOU	Investor-owned utility
IRA	Inflation Reduction Act
IRR	Internal rate of return
ITC	Investment Tax Credit
LCSE	Lifetime cost of saved electricity
LMP	Locational Marginal Prices
LMR	Load Modifying Resources
LNG	Liquefied natural gas

LR	Load Resources
MISO	Midcontinent Independent System Operator
MTP	Market transformation program
NCLR	Non-Controllable Load Resources
NERC	North American Electric Reliability Corporation
NSRS	Non-Spinning Reserve Service
PRA	Planning Resource Auction
PUCT	Public Utility Commission of Texas
PURA	Texas Public Utility Regulatory Act
PV	Solar photovoltaic
QSE	Qualified Scheduling Entity
RRS	Responsive Reserve Service
SB 6	Senate Bill 6
SECO	State Energy Conservation Office
SOP	Standard offer program
TAC	Texas Administrative Code
TRM	Technical reference manual
UFR	Under-Frequency Relays
UPS	Uninterruptible power supply
VFD	Variable frequency drives
VPP	Virtual Power Plant



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