



RECOMMENDATIONS *of the*
SPEER COMMISSION

..... on

Texas Energy Efficiency Policy



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Contents

SPEER Commission on Energy Efficiency Policy Roster	2
Letter from the Co-Chairs	3
Letter from Staff	4
Executive Summary	5
Introduction	8
Principles	10
Recommendations	11
1 Coordinate State Activities to Support Energy Efficiency and Drive Related Education Efforts	13
2 Ensure High Energy Performance in New Homes and Buildings	14
(2a) Improve Compliance with Building Energy Codes	15
(2b) Create Voluntary Builder Incentives for Homes that Exceed the Energy Code	16
(2c) Adopt Statewide Energy Codes As They Are Issued	17
3 Enable Access to Financing for Energy Efficiency Retrofits	19
(3a) Adopt Commercial Property Assessed Clean Energy (C-PACE) Programs	20
(3b) Create a Residential Energy Efficiency Retrofit Loan Program	21
(3c) Expand Water Conservation Funds to Include Energy Efficiency	22
(3d) Make Residential PACE Financing Available	23
4 Align Electric Companies' Interests with Increasing Efficiency	24
(4a) Initiate Policy Dialogue on Revised Rate-setting to Support Energy Efficiency	25
(4b) Commission a New Energy Efficiency Potential Study	27
5 Leverage the Smart Grid to Drive Efficiency Actions	28
6 Use Energy Efficiency to Improve Air Quality and Regulatory Compliance	30
(6a) Create an Energy Efficiency Registry for Air Quality Compliance	31
(6b) Further Develop the State's Ability to Quantify Emissions Benefits from Energy Efficiency	33
7 Increase Public Sector Energy Efficiency to Save Taxpayer Money	34
(7a) Establish Consistent Goals for Public Buildings and Benchmark to Allow Easy Comparisons	35
(7b) Retrofit Street Lighting for Higher Efficiency and Taxpayer Savings	36
Acknowledgements	37

SPEER Commission on Energy Efficiency Policy Roster

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2. **Bill Barnes**, Director of Regulatory Affairs, NRG Energy
3. **Garrett Boone**, Chairman Emeritus and Co-Founder, The Container Store
4. **Mary Anne Brelinski**, Head, N.A. Retail, and SVP Power Generation, EDF Trading
5. **Mike Burke**, Chair, San Antonio Clean Technology Forum, former CEO Tesoro Petroleum
6. **The Honorable Warren Chisum**, former Texas House Appropriations Chairman
7. **Dr. David Claridge**, Director, Energy Systems Laboratory, Texas A&M University
8. **Michael Eastland**, Executive Director, North Central Texas Council of Governments
9. **Dr. Thomas Edgar**, Director, UT Energy Institute
10. **John Fainter**, President and CEO, Association of Electric Companies of Texas
11. **The Honorable John Hall**, former Chair, Texas Natural Resource Conservation Commission
12. **Bret Kadison**, Developer, Brazos Resources and Rosebud Capital
13. **The Honorable Margaret Keliher**, former Dallas County Judge*
14. **Debbie Kimberly**, VP of Customer Energy Solutions, Austin Energy
15. **Jonathan Kleinman**, VP, CLEAResult
16. **Jim Marston**, VP, Environmental Defense Fund's Climate and Energy Program
17. **Kenneth Mercado**, SVP, Electric Operations, CenterPoint Energy
18. **Jay Murdoch**, Director, Industry and Government Affairs, Owens Corning
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20. **Celina Romero**, Partner, Duggins Wren Mann & Romero
21. **Ned Ross**, Vice President of Strategy and Government Affairs, Direct Energy
22. **Andrew Weissman**, Counsel, Haynes and Boone
23. **The Honorable Will Wynn**, former Mayor, City of Austin*

*Co-Chairs

Note, while the organizational affiliation of individuals is indicated in this report, it is done only as an indication of the level of experience and of the differing perspectives included in this process, and does not constitute implicit or explicit endorsement of this report or its contents by their organizations.



Letter from the Co-Chairs

While Mayor of the City of Austin and County Judge of Dallas County, we knew, and we still know after leaving elected office, that energy efficiency should always be our “first fuel:”

- Efficiency stimulates jobs and economic activity;
- Efficiency increases the competitiveness of our state and local communities;
- Efficiency reduces electric bills and helps make housing affordable;
- Efficiency reduces pollution and improves public health.

The recommendations of this Commission represent a pragmatic set of action items that fit within the Texas political context. There are no radical ideas or policy prescriptions here but rather a consensus set of policy recommendations that can move Texas toward a more efficient, stronger economy.

We were honored to Co-Chair the SPEER Commission on Energy Efficiency Policy. It’s an impressive group of remarkable and intelligent individuals representing very diverse viewpoints. Despite differences of perspective and experience, the group was able to unanimously agree on a robust set of policy recommendations that have the potential to benefit all Texans. We hope readers of this report will find our collaborative effort to define a path forward of value to their own initiatives and interests.

SPEER plans to make this report publicly available and build on the Commission’s recommendations in the years to come. Some of these recommendations can be implemented in the short or medium term, while others will take many years or more in some cases. This document is meant as the beginning of an effort to reinvigorate the state’s dedication to energy efficiency as a resource that still holds massive potential. Efficiency is local, clean, cheap, and abundant.

Judge Margaret Keliher

Mayor Will Wynn

Letter from Staff

The State of Texas has a well-earned reputation for having crafted the best functioning and most brutally competitive electric market in North America. Without knowing anything about the complexity and technology that underlies this market, most Texans have been able to pick a competitive electric provider and still have confidence the lights will come on when they reach for the switch.

The Electric Reliability Council of Texas (ERCOT), which oversees and manages both the operation of a vast grid, and the competitive buying and selling of power at wholesale every 5 minutes, is the focus of a perpetual effort of continuous reinvention by a wide range of stakeholders. Ahead of most other states, our legislature has also authorized, and the investor-owned utilities have now deployed, a communications network of advanced digital meters that is helping manage the grid and the power market more cost effectively as well. We spend billions of dollars on the systems and infrastructure to facilitate the delivery of power from generation to customer. We have adopted policies making Texas the leader in both distributed and renewable energy generation. And regulating all this and assuring consumer protection, we have the Public Utility Commission of Texas.

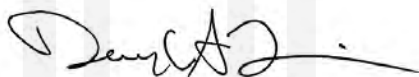
Achieving energy efficiency in our homes and businesses is every bit as complex and technical—and as challenging for the average consumer to comprehend—as electric power generation or the operation of the grid. It is made more complex by the greater diversity of the solutions and solution providers in the market. But the State has not invested the same level of attention to devising a parallel delivery system for individuals and businesses to achieve higher end-use energy efficiency. We founded SPEER, in part, to begin to explore the possibility of an organized market for energy efficiency products and services. Like our electric market, we think Texas can support and enhance competition, and also help increase the efficiency with which consumers can obtain the services they want. Adopted appropriately, investment in efficiency can actually pay for itself, but to do it properly and be assured of that today is too daunting a prospect for most building owners.

This SPEER Commission was organized in an effort to begin the process, not of determining what is possible technically, but what it is possible for a diverse set of people to agree upon. The recommendations reflect the wisdom and experience and values of an impressive roster of volunteers. It was our attempt, over a series of only 4 meetings around the state, to identify at least some elements of a shared vision for where energy efficiency fits in the evolving Texas market ecosystem.

We hope this beginning will inspire others to become engaged in this exploration with us. We encourage policymakers, industry, academic institutions, advocacy organizations, and individuals to consider or adopt the following recommendations, and improve upon them to the benefit of us all.



Robert J. King, CEO



Doug Lewin, Executive Director



Executive Summary

Texas is an energy state. We lead in production of oil and natural gas, still plentiful, if finite, fossil fuels. We also lead in renewable resource production like wind power. We understand efficiency is critical to our productivity and competitiveness here and abroad. For two decades we have been engaged in the redesign and continuous improvement of what is arguably the most competitive electric power market in the world. State support for the transformation of ERCOT into an independent system operator of the physical grid, and a platform for the competitive buying and selling of electricity, has resulted in tremendous macro-efficiencies. It has spurred technical and market innovations, from which Texans will reap benefits for decades, and will be a model for others to emulate.

Technologies are evolving very rapidly, making significant reductions in energy use possible. The irony may be that the delivery of new energy efficient knowledge and technology is itself not a terribly efficient process from the perspective of consumers, and a number of market barriers exist. Some of the blame for this falls on the energy efficiency industry itself, although defining that industry is made more difficult by its very distributed nature and diversity. SPEER is the first effort in this region to bring some cohesion and organization to industry focused on efficiency in the built environment, and these recommendations are the result of our first effort to define a shared vision for how we might improve the market for efficiency in Texas.

Over the course of the last year, a diverse, experienced, and intelligent group of 23 individuals met to discuss the best ways to overcome existing market barriers and advance energy efficiency in Texas. This report represents an initial consensus vision. Taken together, these recommendations suggest gradual but significant change, designed to increase not just the efficiency of building stock, but the efficiency of the economy.

The Commission's recommendations fit into seven categories: they are each summarized below and explained more fully in the body of the report.² In addition the Commission recognized a few important principles including the recognition that energy efficiency leads to water efficiency, and an informed consumer is required for the efficient operation of a market.

(1) Coordinate State Activities to Support Energy Efficiency: Many different agencies have a hand in energy efficiency. The governor or legislature should identify and empower an existing state agency to be accountable for proposing and developing appropriate policies and programs for the advancement of energy efficiency and the training and education of industry and consumers.

(2) Ensure High Energy Performance in New Buildings: Homes and buildings constructed today will stand for the better part of a century or longer. Texas should ensure that they are constructed to optimize efficiency. The Commission makes three recommendations to realize this goal:

- a. Increase compliance with existing building energy codes.
- b. Create voluntary incentives for builders who significantly exceed base energy codes.
- c. Adopt newer energy codes as they are issued.

² The alphanumeric designations of each of the policies identified here directly correlate to the fuller description of the policies in the full report.

(3) Enable Access to Financing for Energy Efficiency Retrofits: Of all the barriers to increasing efficiency, lack of access to, or reluctance to use, scarce available capital is the most often cited and difficult to overcome.

- a. The Legislature addressed efficiency financing by enabling Property Assessed Clean Energy (PACE) programs for commercial buildings. Local governments should adopt commercial PACE without delay.
- b. Texas should establish a WHEEL residential retrofit loan program to help finance efficiency projects. This initiative, begun by other states, would leverage private funds to stimulate economic activity.
- c. The State should expand the use of SWIFT to include projects that couple water conservation and energy efficiency.
- d. The Legislature should address deficiencies in statute that prevent local PACE programs from being available to serve residential markets.

(4) Align Electric Companies' Interests with Increasing Efficiency: Texas has the opportunity to lead the next wave innovation in efficiency policy by finding more ways to allow efficiency to contribute to the electric market. This would increase competition in an already very efficient market.

- a. The State should begin the transition of utility rate regulation to better align the interests of electric companies and their customers. Deriving its revenue from its investment and volume of sales does little to incent a utility to seek, promote, or support energy efficiency, or reduce capital requirements.
- b. The PUCT should commission a study to determine the potential for utility administered energy efficiency programs that benefit all customers.

(5) Leverage the Smart Grid to Drive Efficiency Actions: Texans are investing billions of dollars in smart meters that hold enormous promise for consumer convenience and efficiency. The PUCT and utilities have already taken many important steps, and the market is beginning to manifest this potential. The PUCT should lead a collaborative process to create a roadmap toward realizing the full benefit of the smart grid. The roadmap should include the following features.

- Utilities should focus incentives on connected devices that can help consumers save money. The PUCT should allow utilities to offer incentives tied to customer participation in efficiency and load management programs of the REPs or third-parties as well as of the utilities themselves.
- ERCOT should establish the market infrastructure for energy service companies, including REPs and third parties, to increase participation of customer loads (demand response) in the real time energy market directly.
- The PUCT and ERCOT should undertake a collaborative project to investigate how verifiable energy efficiency, which achieves dependable long-term savings and reduces overall demand could be compensated (incented) through an ERCOT market mechanism.



- The PUC should ensure Smart Meter Texas enables the competitive market to increase the use of energy data to drive energy efficiency.
- The entity designated by the PUC to manage the utility's smart meter data platform, Smart Meter Texas, should host IT developer conferences to provide the information and access needed for application developers to implement innovations.
- The PUC and the electric industry should coordinate a campaign to increase education about the capabilities of smart meters, and related digital technologies, so that customers understand the potential savings.
- The PUC and ERCOT should collaborate with Texas A&M's Energy Systems Lab to track energy savings from retail electric provider and third party energy service providers, in order to quantify savings and associated emissions reductions so that credit from these efforts can be claimed in state implementation plans for air quality compliance.

(6) Use Energy Efficiency to Improve Air Quality and Regulatory Compliance: Texas was one of the first states in the country to use energy efficiency as a control measure in a State Implementation Plan, and receive regulatory credit for the contribution of building codes in reducing smog.

- a. Texas should create an energy efficiency registry to track efficiency initiatives so that the State and local communities can be credited appropriately.
- b. The Legislature should ensure that the capacity to calculate emissions reductions associated with energy efficiency is available, by increasing support for Texas A&M's Energy Systems Laboratory.

(7) Increase Public Sector Efficiency to Save Taxpayer Money: Public entities spend billions of taxpayer dollars on energy and water. As stewards of public resources, they should ensure that these dollars are spent efficiently.

- a. Every public entity should have an energy savings goal and track progress toward that goal using free and available benchmarking programs. Further, the Legislature should clarify confusing and conflicting statutory provisions related to public entities' efficiency goals.
- b. The Commission particularly recommends that public entities retrofit streetlights with high efficiency lighting wherever cost effective.

Introduction





Introduction

We all agree that energy efficiency is beneficial. Increased efficiency reduces energy costs, as well as associated costs of the infrastructure needed for meeting peak demand for individuals and businesses. Investment in greater efficiency can save precious water.

Energy efficiency increases energy productivity. The more economic activity Texas gets from each unit of energy, the more competitive we are in the global economy. If businesses use energy more efficiently, the cost of doing business in Texas is lower. If consumers use energy more efficiently, it decreases the cost of living. These impacts lead to increased spending and a stronger, more efficient economy.

However, there is an important tension between obtaining societal benefits of efficiency and preserving personal freedom, customer choice, limited government, streamlined regulation, and a competitive energy market.

We agree that increasing energy efficiency in Texas is a goal worth pursuing, but we also agree that market-based mechanisms are the preferred route to cost effective energy efficiency in Texas. We acknowledge, though, that the market has imperfections, particularly including imperfect information, split incentives, and the burden of upfront costs for efficiency upgrades not incurred to simply continue consumption of electricity. We want to find policy solutions, but solutions that require the least policy intervention possible to overcome such systemic barriers.

Energy efficiency is consistently an extremely cost effective energy resource, yet it is a challenge to determine the right combination of policy solutions to more fully integrate efficiency into our electric market design.

We believe that cost effective energy efficiency is a wise investment that benefits all Texans and thus its pursuit should be engaged in and broadly supported by our policymakers.

Definitions

One important differentiation discussed is between conservation, demand response and energy efficiency:

- **Conservation** is not using energy, or using less energy, requiring a behavior modification and possibly sacrificing comfort.
- **Demand response** is not using energy at a certain time, for a limited duration, whether in response to a grid emergency or organized program of load management, or in response to short term price signals.
- **Energy efficiency** is using less energy while maintaining the same level of comfort or service—that is, using less through the use of better design, materials, products or equipment, not dependent upon behavioral response.

Principles

- 1) Education is critical to the welfare of the state and its citizens.** Education on energy, and particularly the evolving energy markets and customer choice, both of energy and efficiency alternatives, is important for the market to function properly and achieve the highest level of efficiency possible. Policymakers and market participants need to work together to ensure that customers understand how they can be more efficient and have easy pathways to increasing efficiency.
- 2) Water and energy use are inextricably linked.** We use water to cool traditional power generation plants; the electric sector is one of the largest users of water in the state after agriculture. Water purification and distribution, and wastewater treatment are among the largest users of electricity in the state. Anything we do to be more water efficient saves energy. Anything we do to be more energy efficient saves water.
- 3) Additional investments in energy efficiency should result in a positive outcome for all Texans.** Customers bear the cost of state sponsored efficiency programs, whether state operated or utility administered. We support additional spending to stimulate or assist various market participants to acquire or achieve greater efficiency, so long as participants and non-participants alike realize a net benefit. New expenditures should therefore meet this test: but for the investment in such efficiency, electric bills would be higher for all customers. The State should continue to invest in robust evaluation, measurement, and verification (EM&V) to ensure programs are highly cost effective.
- 4) Reducing energy consumption on an aggregate level requires the participation of many individuals and companies.** An ideal state energy policy would support and enable every market participant to contribute in a way appropriate to each.
- 5) Expanding availability of financing programs, allows customers to reduce upfront expenditures and amortize costs over longer periods of time.** With robust financing options for customers, utility rebate funds and customer investments could be leveraged to stimulate even more cost effective efficiency.

Recommendations



Recommendations

One of the major elements lacking in strategies to move energy efficiency forward is a high-level, broad-based, shared vision for our energy future. By bringing together diverse viewpoints to discuss energy efficiency and agree on a set of recommendations, this initiative is a first step toward bringing about a shared vision around energy efficiency with respect to electric power and the built environment.

The SPEER Commission met in person four times in 2014-15 and various subcommittees of the Commission met in between to further explore and examine policy issues in more detail. The Commission meetings used Chatham House Rules, in which SPEER could benefit from the information received, comments or insights expressed, without revealing the name or affiliation of the speaker for particular statements. This format allowed for ideas to be shared without fear of attribution and encouraged robust open discussions and debate. The consensus then became the basis of this final report, which the group is willing to share and support.

These recommendations were produced by a 23-member Commission with diverse viewpoints and backgrounds. The Commission addressed many complex and difficult topics. Compromise was required in order to arrive at consensus and thus, not every member agrees with each recommendation exactly as it appears. It is possible also that if each

recommendation were broken out and taken by itself, some might not achieve full consensus. However, when taken as a whole, all of the Commission members agree that this final product represents a balanced and meaningful set of energy efficiency recommendations for Texas. It is our hope that these recommendations will win broad support and begin to advance energy efficiency and create a foundation for SPEER, and for Texas to build on in coming years.

Before each meeting, Commission members received a white paper delving deeply into a particular issue area, namely: energy efficiency as a resource, energy efficiency as an air quality improvement strategy, and evolving utility business models. These papers are available at www.eepartnership.org/SPEERCommission together with a special report on intelligent energy efficiency addressing the potential value of the smart grid, and each may serve as a complement to these recommendations, but were not approved by the Commission.

Coordinate State Activities to Support Energy Efficiency and Drive Related Education Efforts

Energy efficiency is quite complex to achieve at scale. It not only requires many individuals and firms to take action, but efficiency service providers make up a diverse and distributed sector in which technologies are continuously evolving and competing solutions provide a confusing array of potential pathways for service providers as well as consumers. Training is needed to increase technical knowledge and skills in the building trades and related professions. Education of consumers is needed both to help each participate in the competitive market, where available, and realize the full benefit of evolving technologies and service alternatives.

No office or position within State Government has the primary responsibility to consider and evaluate the appropriate role of government and the need for or efficacy of statewide efficiency policies. The State Energy Conservation Office has some programs pertaining to energy efficiency, as do the Public Utility Commission, the Texas Department of Housing and Community Affairs, and the Texas A&M Energy Systems Laboratory, but these programs only extend to specific jurisdictions with little ability to create statewide direction or impact. The Texas Commission on Environmental Quality oversees the inclusion of efficiency in air quality State Implementation Plans, and the Texas Workforce Commission oversees training and professional education initiatives of the State.

In the mid-1970s the Governor and Lt. Governor created the Governor's Energy Advisory Council, which provided leadership on all energy issues by bringing the disparate Texas agencies together to develop an overall vision and coordinate the actions of the various arms of Texas government. This also allowed the state to have a more effective voice at the federal level.

RECOMMENDATION:

The governor and/or legislature should identify and empower an existing state agency to be accountable for proposing and developing appropriate policies and programs for energy and water efficiency across Texas. The agency and individual(s) assigned to the task should coordinate efforts across all agencies and offices to ensure the best use of state and taxpayer resources to obtain energy efficiency, support education and training, and thereby increase economic competitiveness in the state.



2

Ensure High Energy Performance in New Homes and Buildings

Building systems and equipment will be replaced many times over the life of the building, but the building itself, if designed and built right, will last for the better part of a century or more. We must ensure that new buildings are built at least to the level specified in energy codes, and that leading builders have incentives to drive toward higher efficiency.



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Integrating energy efficiency into a project at the time of construction is the most economical way to create homes and buildings that are both durable and affordable to maintain, while saving energy and water resources for the lifetime of the building.

”



(2a) Improve Compliance with Building Energy Codes

In Texas, though there is a mandatory statewide energy code applicable to all new homes and buildings, the state has no enforcement authority over energy codes. The legislature protects local jurisdictions' rights to implement and enforce the codes, but there is a lag in this adoption at the local area which hampers uniformity in practice. Unincorporated jurisdictions in Texas either have no code, or have a code but there is no authority to enforce these practices.

The gap between building practice and code minimum does not mean that all new homes and buildings are not safe and are absent energy efficiency measures. To the contrary, as it relates to energy efficiency, Texas has historically had one of the highest market penetrations of Energy Star Qualified Homes and other similar above code or green building programs. That said, a significant number of homes and buildings are built every year that are never inspected, so consumers can't be assured that they are meeting these minimum standards.

Nationwide, a number of issues contribute to lack of full compliance with all building codes. This challenge is not unique to Texas. One would think that closing the gap on code compliance may include the need for rigorous pre-construction plan review during the permit process and thorough in-field inspections and even testing or commissioning of homes and buildings in the field. While that may be the ideal remedy, this thinking almost always collides with the real world realities around available financial resources to do plan reviews, inspections, and testing and commissioning. Further, as it relates to the energy code, the attention to priorities of life safety (fire and structural), health (mechanical and plumbing), and property protection, energy efficiency becomes the lowest priority.

The lack of full compliance with the energy code results in missed savings opportunities and affordability for the consumer, homeowner, tenant, and commercial property owner. At the state level, additional efficiency

in the building stock can make energy more affordable and reliable to all consumers. Because we really have only one shot at getting energy efficiency right at the time of construction—when it is most cost effective—any gaps in compliance can become permanent and persistent for the life of the home or building. This missed energy savings opportunity gets compounded year after year. When you consider that many homes and buildings have a life-span of 70+ years, this represents a massive missed opportunity in cost effective energy savings.

The Texas Energy Code Compliance Collaborative (TECCC), which is facilitated by SPEER, is one proactive and collaborative initiative to examine and deploy remedies to this non-compliance, since 2011. This collaborative includes representatives of state agencies, local government, and various industry leaders. As a result of this effort, SPEER has established an Energy Code Ambassador program which provides advanced training and access to resources to code officials, builders, and third-party raters and inspectors to provide local “peer-to-peer” assistance to raise compliance by all participants in the industry.

RECOMMENDATION:

Homes and buildings constructed today will stand for the better part of a century or longer. Texas should ensure that they are constructed to optimize efficiency by ensuring compliance with existing building energy codes.

(2b) Create Voluntary Builder Incentives for Homes that Exceed the Energy Code

Building highly energy and water efficient homes is achievable today in Texas using existing off-the-shelf technologies and practices. However, it can take the homebuilding industry 7-10 years to integrate technologies and practices that are readily available but new to builders. Barriers such as added first costs of efficiency, the perceived added risks and potential warranty issues that new practices might bring, the lack of education and guidance for builders on how to integrate new practices into their offering, and the concern that the consumer will not place a value on and thus pay for these non-curb appeal measures, all conspire to prevent homebuilders from effectively integrating these technologies and practices into their standard means of designing and building homes. However, these barriers can be overcome by creating incentives for more efficient homes. Further, by leveraging or repurposing existing resources to provide the persistent safety net of education, training, and in-field mentoring so that builders can make incremental shifts in their practices to hit their target outcomes, we can take pain and risk out of the transition to such practices for the builder.

Leading Texas home builders and developers should have a prominent role in setting the targets and criteria for any voluntary incentive. Because there is no corporate income tax in Texas, which is often used for these types of incentives in other states, creative State or local incentives could be explored. These could include such initiatives as permitting higher densities for subdivisions, expedited subdivision approvals or inspections, or other trade-offs that the home builder or developer can monetize or place some other value on.

RECOMMENDATION:

State and local policy makers should work with Texas builders and developers to determine user-friendly incentives for builders to build highly energy and water efficient homes. When creating such measures, state and local government should consider methods that allow builders or developers to combine a suite of incentives, such as a utility rebate, manufacturer rebate, federal, state and local tax credits, or clean air and water program funds.



(2c) Adopt Statewide Energy Codes As They Are Issued

Integrating energy efficiency into a project at the time of construction is the most economical way to create homes and buildings that are both durable and affordable to maintain, while saving energy and water resources for the lifetime of the building.

The State of Texas adopted its first statewide mandatory energy codes in 2001 (Texas Building Energy Performance Standards (34 TAC §19.53)) as a way to reduce energy use and air emissions. The State Energy Conservation Office (SECO) was delegated the authority to periodically revise the State standard, as the consensus-based International Energy Conservation Code is updated. Though SECO has the authority to establish the baseline for the state's minimum code, the Texas Legislature protects the jurisdiction's rights to implement and enforce the code.

Since the first adoption in 2001, SECO adopted the following 2009 codes to increase building efficiency:

- Residential (Single Family Residences And Duplexes)
 - Effective January 1, 2012 - 2009 IRC³, Chapter 11
- State-Funded Residential Buildings
 - Effective June 1, 2011 – 2009 IECC⁴
- Commercial And Residential (Excluding Single-Family Residences)
 - Effective April 1, 2011 - 2009 IECC
- State-Funded Commercial Buildings
 - Effective September 1, 2011 – ASHRAE 90.1 2010

In 2011, SECO initiated the review and consideration of the 2012 energy codes and in 2014, initiated the review and consideration of the 2015 energy codes. The Texas A&M Energy Systems Laboratory (ESL) made a determination to SECO that the 2012 IECC/IRC and 2015 IECC/IRC are both an improvement to the 2009 IECC/IRC currently in effect. This determination by ESL facilitated local governments' ability to consider and adopt the 2012 or 2015 IECC/IRC or versions of them. ESL recommended adoption in both determinations, but no action has been taken by SECO to adopt either of these stronger energy codes statewide.

At recent count, a total of 65 cities in Texas have opted for energy codes with higher efficiency than the SECO adopted code (2009 IRC Chapter 11/2009 IECC). Many of these cities have adopted the 2012 IECC, or some version of it, ahead of the State.

This incremental transformation of our building practices has been facilitated by the offering of voluntary programs to builders, often tied to incentives that helped to off-set some of the added costs to improve building practices. These programs include the Energy Star Qualified Homes program with support from utilities, and voluntary green building programs sponsored by local home builder associations. Additionally, product

³ International Residential Code

⁴ International Energy Conservation Code

manufacturer and supplier incentives enabled builders to shift certain practices. Combined with local governments adopting more efficient codes or amendments over time, this incremental transformation provides builders a chance to develop more efficient practices and work these into their standard operating procedures. All of these measures helped to take the “pain” out of the process and thus not be negatively disruptive to the building process and industry.

While these are constructive and positive actions, there remain two significant gaps related to the energy code. First, some local governments have either no energy code or are not yet on the State minimum of the 2009 IECC/IRC. Second, many jurisdictions have an energy code on the books, but there are no plan reviews or inspections for compliance with the code. Both of these gaps lead to non-compliance and missed opportunities to save energy and ensure the long-term durability and efficient operation of homes and buildings. It is critical that lagging jurisdictions catch up and adopt the State minimum energy code. Further, to fully realize the potential of the energy code, there needs to be sustained education and outreach to all building trades, building design professionals, and city code officials, to raise awareness and increase compliance.

RECOMMENDATION:

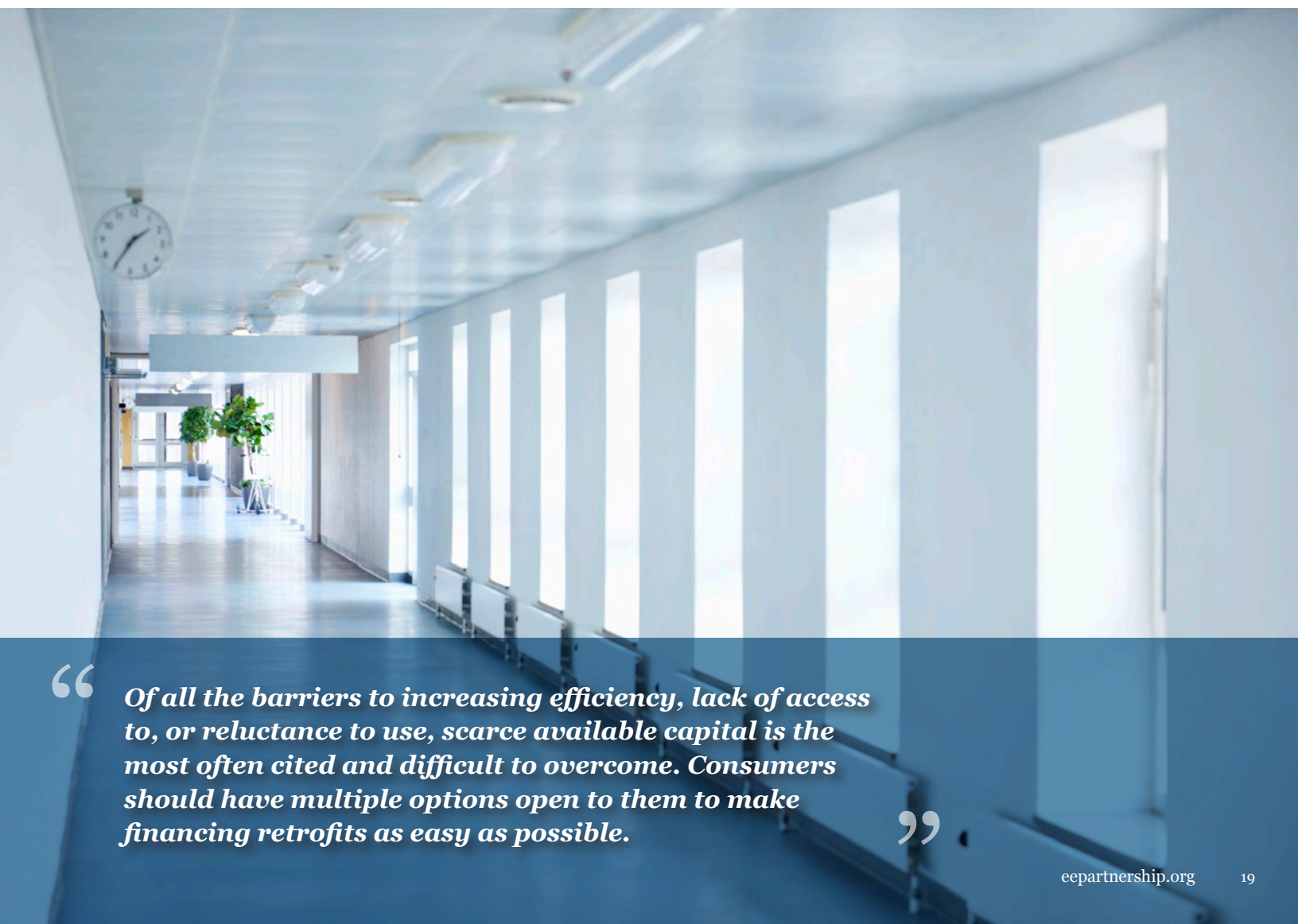
SECO should move forward with the process of adopting either the 2012 or the 2015 energy codes in accordance with the Texas Building Energy Performance Standards under Texas Health and Safety Code, Chapter 388. Further, the State should consider additional ways to support local governments in this transition and, provide resources to the building industry, which will in turn provide residents more durable and affordable homes and buildings for decades to come.



3

Enable Access to Financing for Energy Efficiency Retrofits

The largest opportunity for capturing additional efficiency is the upgrade of existing buildings, which consume approximately 40% of all energy in the state. Although many energy efficiency measures could save customers money over the long term (while providing improved health and comfort benefits), the up-front cost is a barrier to more rapid and widespread adoption of cost-effective solutions in existing buildings. There are many paths to financing energy efficiency retrofits. The specific financing strategies described in this section are not meant to be an all-inclusive list. Other financing methods are valid, but the Commission believes the ones described here hold the most promise at this time.



“

Of all the barriers to increasing efficiency, lack of access to, or reluctance to use, scarce available capital is the most often cited and difficult to overcome. Consumers should have multiple options open to them to make financing retrofits as easy as possible.

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(3a) Adopt Commercial Property Assessed Clean Energy (C-PACE) Programs

Through state policy and market design, utilities have access to low interest, long-term financing, so consumers are never faced with initial capital investments. But owners of commercial buildings and homes wanting to make investments in energy efficient equipment do not have access to similar financing. It is appropriate and important for the State and local governments to adopt policies or take actions to help customers finance efficiency improvements at attractive terms to accelerate the uptake of efficient practices, products and services. Local governments can adopt commercial PACE programs for commercial buildings today, giving building owners access to long term financing at low rates to upgrade infrastructure and equipment. The Texas Legislature has approved legislation allowing local governments to facilitate financing of commercial building improvements through property assessments.

RECOMMENDATION:

Local governments should adopt streamlined, consistent commercial PACE programs, with regional coordination in line with the PACE in a Box model, developed by the State Energy Conservation Office, Keeping PACE in Texas, and many others. The State should encourage consistent implementation of PACE for commercial buildings.





(3b) Create a Residential Energy Efficiency Retrofit Loan Program

The National Association of State Energy Officials (NASEO), working with Pennsylvania initially, and now with additional states, including Kentucky, Florida and New York, has created a method using public-private partnerships to make capital more easily and more competitively available for residential energy efficiency and water conservation projects. WHEEL, or the Warehouse for Energy Efficiency Loans, makes state-supported but privately financed loans available to consumers, aggregates them, and makes investment grade securities available to institutional investors. This newly created secondary market is successful because it requires uniformity of programs adopted across the country, creating the consistency needed for investors to participate. Loans are affordable because participating states institute a mechanism to help reduce the risk of collections and reduce interest rates. Texas has multiple sources of public funds that could be similarly leveraged with private capital for efficiency financing.

By supporting private investment in efficiency through WHEEL, Texas could promote energy and water conservation, which would reduce emissions and help to conserve precious resources. If used as a backstop or loan loss reserve, for example, a minimal appropriation of Clean Air Funds could spur hundreds of millions in private investment in the State. Alternatively, Texas could also leverage its Clean Water State Revolving Fund (CWSRF) or Proposition 6 water funds to leverage private investment in residential energy efficiency and water conservation. Other states are already pursuing similar models.

RECOMMENDATION:

The State should use appropriate clean air, water, or other funds in order to join other states in the development of WHEEL. The State would be making an investment—not a grant—which would leverage hundreds of millions of dollars in private capital to save energy and water and spur economic growth.



(3c) Expand Water Conservation Funds to Include Energy Efficiency

In 2013, the Texas Legislature passed and voters approved the creation of a State Water Implementation Fund (SWIFT) to provide financing for water projects included in the State Water Plan. In response to the drought and the state's need to conserve water, 10% of the funding is directed towards rural communities and agricultural water conservation, and not less than 20% must support water conservation.

The State Water Plan defines water conservation as including water savings from municipal, irrigation, and “other” (mining, manufacturing, and power generation) water users. Currently, political subdivisions, including non-profit water supply corporations, municipalities, counties, river authorities, special law districts, water improvement districts, water control and improvement districts, irrigation districts, and groundwater conservation districts can apply for assistance to use these funds for projects in their region.

Creating a water conservation project with positive cash flow for end users is difficult due to the low cost of water. Political subdivisions may be challenged to identify water conservation projects that will have a return on investment within the terms of the SWIFT. Coupling water conservation projects with energy efficiency improvements would likely help political subdivisions create projects that meet the conversion requirement and are cash flow

positive for borrowers. The terms of the loan should be allowed to extend from 5-20 years to match positive cash flow. Because energy efficiency also saves water, sometimes indirectly, all the way back to the generator, using these funds for combined water and energy efficiency projects could be an excellent way to pursue water conservation.

RECOMMENDATION:

The State should expand the use of SWIFT to capitalize and include projects that couple water conservation and energy efficiency. The fund could also be used as part of the State loan loss reserve for residential WHEEL, or loaned out locally by political subdivisions to assist homeowners in water and/or energy efficiency improvements.

(3d) Make Residential PACE Financing Available

PACE programs allow commercial building owners to access financing for energy efficiency upgrades while placing a special assessment on their property that serves as a senior lien. While commercial PACE has been passed in Texas by the 2013 legislature, residential PACE is currently not an option for homeowners.

The Texas Legislature passed a bill in 2009 to enable residential PACE. Aside from technical implementation problems with the bill itself, residential PACE has since been stymied at the federal level. Still, several states have moved forward to make PACE financing available to homeowners, recognizing potential limitations of the secondary market. If enough large states empowered local jurisdictions to make this tool available to their residents, it is likely the federal regulators would relax their position.

Residential PACE would allow for Texans to access financing to upgrade their homes, making them more energy and water efficient, lowering their utility bills, and helping reduce peak demand.

RECOMMENDATION:


The Texas Legislature should correct technical deficiencies in the 2009 Texas PACE bill to create the opportunity for the appropriate local jurisdictions to adopt and launch residential PACE programs.



4

Align Electric Companies' Interests with Increasing Efficiency

Energy efficiency provides significant public benefits, and historically utilities have proven valuable partners to the states in administering programs to encourage and assist consumers to adopt energy efficiency. A drawback to having utilities conduct energy efficiency programs, however, is that pursuing customer energy efficiency is typically not in a utility's economic interest, because reduced consumption reduces revenues under the current system of regulation.



“ Texas has the opportunity to lead the next wave innovation in efficiency policy by finding more ways to allow efficiency to contribute to the electric market. This would increase competition in an already very efficient market. ”



(4a) Initiate Policy Dialogue on Revised Rate-setting to Support Energy Efficiency

The traditional sources of a utility's profits are the returns it is allowed to earn on capital investments and revenue growth resulting from increased customer consumption. If a utility helps its customers reduce their consumption the resulting loss of revenue is detrimental to the utility's profitability. Similarly if a utility enables customers to reduce peak demand, it loses the opportunity for a capital improvement upon which it traditionally earns a return. Such losses might be redressed in a rate case, but rate-setting is an expensive, lengthy process with outcomes that are difficult to predict, so utilities are cautious about initiating a proceeding for a rate increase. This is not a condemnation of utilities, but simply recognition of the disincentives utilities face under rate regulation as conventionally structured by policy makers.

Rate-setting in Texas is generally consistent with traditional rate-setting, with a couple of modifications. The legislature directed that the Public Utility Commission adopt rules designed to ensure timely cost recovery for utility energy efficiency expenditures and reward utilities that exceed their energy efficiency goals cost effectively. This involves an annual review and setting of a rate for energy efficiency costs, and awarding a bonus that is recovered through the energy efficiency rate. The Commission has also adopted rules that track transmission and distribution investment and allow periodic increases in rates, based on new investment in these facilities. In other states, additional regulatory mechanisms have been developed and are now used to remove the disincentive for energy efficiency, or to create different incentives for utilities.

ALTERNATIVE RATE MECHANISMS

Approaches to address the "reduced revenue" disincentive associated with energy efficiency include decoupling, a lost revenue

adjustment, and a change in rate design that is referred to as straight fixed/variable rates. Under decoupling, the utilities' rates are adjusted periodically in an expedited regulatory proceeding, so that the utility recovers revenues at the level approved in its last rate case, despite changes in the level of customer consumption. A lost revenue adjustment mechanism calculates the revenue loss resulting from a utility's energy efficiency program, other efficiency, or even revenue declines associated with reduced consumption in an economic downturn, and charges that amount to customers in the following year. The straight fixed/variable rate design would result in the recovery of most of a utility's costs through a fixed charge, rather than through a volumetric charge. All of these approaches would address the disincentive inherent in conducting energy efficiency programs, although each does not address the need for utilities to seek higher level efficiency in their own operations.

A fourth approach is performance-based rate-making, under which utility rates are

adjusted to include compensation based on their performance in identified areas. This approach involves identifying utility goals, establishing performance metrics for each goal, and establishing rewards and/or penalties for a utility's performance against the metrics. A number of states have adopted performance payments for rewarding a utility's support for energy efficiency and/or other goals to better align the interests of utilities with the interests of customers.

Rate-setting in Texas is difficult, in part, because there are many interested entities that participate in it, including the Commission, the Public Utility Counsel, various customer groups, and cities. Cities have a special role as the initial forum for setting rates for customers within a city's limits. Some of the approaches addressed above might be reforms that the Commission could adopt without additional legislation, but others would probably

require legislation. Any approach to changing a process with so many interested parties is likely to require a significant policy discussion over an extended period, engaging the Commission and other persons and groups that have an interest in electricity service and prices.

RECOMMENDATION:

The PUCT should initiate a rulemaking project instigating a stakeholder discussion of changes needed in our overall approach to utility ratemaking. This should be done in order to explore how Texas can best adapt to the broader market changes underway, and support efficiency and innovation in the market place, while protecting the integrity of our public utilities.



(4b) Commission a New Energy Efficiency Potential Study

In 2008, the Texas Legislature directed the Public Utility Commission to conduct a study of energy efficiency's potential. The findings were clear: Texas could cost effectively acquire far more energy efficiency. In 2010, the PUCT responded by increasing the efficiency goal and in 2011, the Legislature changed the metric (from growth in demand to a percentage of peak demand) in line with the report's recommendations.

It has been nearly seven years since the last potential report was completed; the data is out of date. For instance, most of the lighting potential calculated was for compact fluorescents whereas today most of the efficiency programs are rapidly moving to Light Emitting Diodes (LEDs). Texas was still on the 2000 Energy Code and is today on the 2009, a far more efficient code. Unsurprisingly, a lot has changed in the last seven years.

RECOMMENDATION:

A new potential study should be commissioned to determine how much energy efficiency can be cost effectively achieved. An emphasis in the study should be put on how to maximize benefits across the system, and include a focus on:

- Targeting energy efficiency projects to obviate the need for new infrastructure.
- Using energy efficiency to:
 - Increase grid reliability.
 - Lower costs for all ratepayers, including non-participants.
- Integrating energy efficiency with demand response, distributed generation, and energy storage.

The State should not wait on the potential study to begin to ramp up energy efficiency efforts, but rather should use a new potential study to ensure that future efforts remain cost effective.

5

Leverage the Smart Grid to Drive Efficiency Actions

The state has rolled out seven million smart meters, creating a smarter grid that utilities currently use for grid management, including some more efficient customer services. The PUC and legislature supported the smart meter rollout and associated costs partially to stimulate the growth of innovation and new technologies that use energy data to help serve customers and save energy and money. Already ERCOT reports that residential customer participation in time-of-use rates enabled by smart meters has doubled between 2013 and 2014, to almost 300,000 customers. Independent evaluation has found that tens of thousands of customers opting to use pre-paid programs linked to their meters are saving near 12% on their bills. Independent evaluation of a sophisticated thermostat optimization app has saved an average of 8% of summer air conditioning in Houston. The PUC has noted that electric demand is no longer directly related to economic growth in the same fashion as has been historically, in part perhaps because of these market innovations.

The benefits associated with advanced meters will increase with the proliferation of connected devices and applications which can provide real time or near-real time information and controls for customers. Emerging devices and apps automate energy efficiency and enable demand response, making it easy for customers to save energy and money. REPs, ERCOT and the PUC can also use the information from smart meters to prove savings in order to quantify energy reductions and earn credit in future air quality compliance plans.

There is still very large untapped potential for these kinds of energy savings. In

part because Texas is a leader in the development of the smart grid, there are still significant market barriers to overcome. Most homes are still not equipped with communicating devices. REPs are developing innovative products that encourage energy savings by utilizing smart grid data. Further savings can be achieved through pairing these initiatives with communicating devices such as thermostats, but the ability to do so is still a challenge because competition assures REP margins are small, and the length of most customer contracts make it challenging to recover equipment costs through rates.

“

Texans are investing billions of dollars in smart meters that hold enormous promise for consumer convenience and efficiency. The Public Utility Commission of Texas and utilities have already taken many important steps, and the market is beginning to manifest this potential. The PUCT should lead a collaborative process to create a roadmap toward realizing the full benefit of the smart grid.

”

RECOMMENDATION:

The PUC should work with utilities, REPs, and other stakeholders to create a road map for completing the journey to a smart meter enabled economy. It should ultimately result in reducing the number of “clicks” required by a customer to access data, or grant access to a third-party service provider, and efficiently manage their energy use. Other key elements for the last mile of the Texas Smart Grid roadmap should include:

- Utilities should prioritize incentives for communicating thermostats and other connected in home devices which can help customers save money. The PUC should allow these incentives to be tied to customer participation in energy efficiency and load management programs of either the utility itself, or in the competitive market through a REP or third party.
 - ERCOT should establish the market infrastructure for energy service companies, including REPs and third parties, to increase participation of customer loads, and other duration-limited resources like storage, in the real time energy market directly, so that demand response can be both compensated appropriately and contribute to price formation.
 - The PUC and ERCOT should also undertake a collaborative project to investigate how verifiable energy efficiency, which achieves dependable long-term savings and reduces overall demand could be compensated (incented) through an ERCOT market mechanism.
 - The PUC should ensure Smart Meter Texas enables the competitive market to increase the use of energy data to drive energy efficiency.
- The entity designated by the PUC to manage the utility’s smart meter data platform, Smart Meter Texas, should host IT developer conferences to provide the information and access needed for developers to implement applications.
 - The PUC and the electric industry should coordinate a campaign to increase education about the capabilities of smart meters, especially within vulnerable communities, so that customers understand the potential savings from innovations such as communicating thermostats, time-of-use rates, active monitoring, or even efficiency and conservation driven by usage of smart meter data.
 - The PUC and ERCOT should collaborate with Texas A&M’s Energy Systems Lab to track energy savings from retail electric provider and third party energy service providers, in order to quantify savings and associated emissions reductions so that credit from these efforts can be claimed in state implementation plans for air quality compliance. These savings should be included in the registry recommended in the next section.



6

Use Energy Efficiency to Improve Air Quality and Regulatory Compliance

The Environmental Protection Agency (EPA) made the policy decision in the mid 2000's to allow states to include energy efficiency as a control measure to reduce NOx emissions, as part of their overall efforts to demonstrate attainment of the ozone standard in their respective State Implementations Plans (SIPs). Texas was one of the first states to submit a SIP with energy efficiency and EPA approved energy efficiency as a control measure. Other states have followed suit and EPA has issued formal guidance to encourage other states to do so as well.



“ Texas was one of the first states in the country to use energy efficiency in a State Implementation Plan but no longer does so. It makes sense for Texas regions struggling to comply with increasingly stringent air quality regulations to make full use of energy efficiency as a compliance strategy. ”



(6A) Create an Energy Efficiency Registry for Air Quality Compliance

There are many strategies that can be used to achieve end-use energy efficiency that fall outside of utility programs. For example, there are locally driven initiatives for capturing efficiency in public building, energy savings delivered from retail electric providers and third-party energy management companies, as well as savings from municipal owned utilities and electric cooperatives unregulated by the utility commission. These efficiency efforts are not currently tracked by the state, which means Texas does not get credit for these activities when being evaluated for efficiency.

As the State strives to improve air quality and comply with air regulations to protect public health, Texas should be able to utilize energy efficiency savings that likely represent lower cost compliance than other choices available. Texas will want to ensure all verifiable additional efficiency is applied toward the EPA goal. So, long as the savings data is collected and reported in a uniform, standardized manner, with verification of results, non-utility energy efficiency should count toward state compliance. This is in keeping with a long history of energy efficiency used for air quality improvement in Texas.

Texas should set up a registry to measure and track savings from:

- Locally driven initiatives
 - Local government building efficiency improvements
 - Private building efficiency driven by local policies and programs (e.g., disclosure ordinances, Better Buildings Challenges, 2030 Districts, etc.)
- Street lighting retrofits
- Financing programs, including:
 - Federal government loan programs, such as the USDA Efficiency Loans
 - Property Assessed Clean Energy (PACE) programs
 - Energy savings performance contracts for governmental entities
 - Revolving loan funds
- Retail electric providers and third-party energy management companies. In Texas' competitive market, many energy efficiency service offerings provide significant efficiency results for end users, sometimes without utility incentives.
- Municipally-owned utilities and electric cooperatives whose offerings are unregulated by the Public Utility Commission of Texas
- Building energy codes

- Industrial and large energy consumer energy efficiency projects (that are not included as a part of utility portfolios)
- Private sector energy efficiency improvements driven by internal sustainability plans, triple bottom line initiatives, and capital improvements to increase competitiveness.

RECOMMENDATION:

The State should establish an energy efficiency registry to ensure credit for all incremental, verifiable, and permanent efficiency savings. It would be appropriate for an agency designated by the Legislature to coordinate efficiency initiatives statewide (see Recommendation #1) to house this registry.





(6b) Further Develop the State’s Ability to Quantify Emissions Benefits from Energy Efficiency

In response to the EPA’s policy decision regarding energy efficiency as a SIP control measure, the Texas Legislature authorized and provided funding to the Energy Systems Laboratory of Texas A&M University beginning in 2001 to carry out the following activities through 2014:

- The evaluation of state energy efficiency programs with the PUC;
- The development of protocols and procedures to quantify SIP creditable emission reductions resulting from energy efficiency, wind and other renewables;
- Authorization to review municipalities’ energy efficiency amendments and to calculate energy savings and emission reductions for political subdivisions reporting to SECO.

Additionally, the Energy Systems Laboratory has begun to quantify the water savings resulting from energy efficiency and the use of renewable energy resources.

RECOMMENDATION:

In order to provide the Texas Commission on Environmental Quality and power plant owners and operators the opportunity to maximize the quantities of emission reductions that may be included in future SIPs and clean air plans attributable to energy efficiency, demand response and renewable energy resources, and to reduce the costs of these plans on Texas’ citizens, businesses and public facilities, the Texas Legislature should provide the Energy Systems Laboratory the additional authority and funding to carry out the following activities in 2015 and beyond:

- To quantify the NO_x, SO_x, particulate matter, and carbon emissions resulting from energy efficiency and demand response programs, and the use of renewable energy resources; and
- To provide the Texas Water Development Board projected water savings resulting from energy efficiency and demand response programs, and the use of renewable resources to consider in developing the Texas Water Plan.

Funding should be restored to original amounts or more to ensure that Texas gets sufficient credit for emissions reductions from energy efficiency efforts in State Implementation Plans.

7

Increase Public Sector Energy Efficiency to Save Taxpayer Money

Public entities like schools, cities, and state agencies, spend billions of dollars every year on energy, water, and gas. State and local governments take up one-fifth (1/5) of commercial real estate in the US, and thus have enormous potential to reduce resource use, save taxpayer money, and provide leadership.

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Public entities spend billions of taxpayer dollars on energy and water. As stewards of public resources, they should ensure that these dollars are spent efficiently.

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(7a) Establish Consistent Goals for Public Buildings and Benchmark to Allow Easy Comparisons

The Legislature has passed numerous laws to encourage—or in some cases require—public entities to monitor and measure use and even set goals to reduce use. But reporting is uneven. Many public entities do an excellent job, but too many do not actively seek ways to reduce use and spending on energy and water, or at least do not comply with reporting requirements.

State and local governments can lead by example. By increasing efficiency, they can save taxpayer dollars, thus reducing revenue requirements, and provide examples for the private sector of how to implement efficiency projects. Their experience with retrofits, because they are public entities and thus can provide valuable case studies and best practices to the private sector. There are numerous examples in Texas of public entities actively increasing energy efficiency, but there is significant opportunity to increase this activity.

RECOMMENDATION:

The state should bring consistency to the reporting requirements and provide education, assistance, and incentives for public entities that actively seek out opportunities to reduce resource usage and save taxpayer money.

Every unit of government should have a publicly stated goal for energy and water reduction and should track and report progress toward that goal.

Governmental entities should benchmark their buildings to compare their energy and water usage to similar buildings to spur energy efficiency actions.

(7b) Retrofit Street Lighting for Higher Efficiency and Taxpayer Savings

Street lighting can be a significant share of municipal electricity consumption. With LED or induction lighting retrofits, cities can realize significant savings. Upgrading a traditional street light to a high efficiency technology can yield as much as 60% savings. The City of Houston, working with CenterPoint Energy, has executed an LED street lighting retrofit project estimated to save the City \$28 million over the next 10 years. El Paso worked cooperatively with El Paso Electric to retrofit street lights and estimates that they will be able to save \$3 million a year which is equivalent to 30% of the City's electric bill once their project is completed.

Because of the different ownership structures of utilities throughout the state (investor-owned versus publically-owned utilities), Texas lacks a consistent process for cities to pursue street light retrofits. Often, due to lack of data, cities and utilities do not even know who owns which street lights within their jurisdiction or service territory.

Whether a city owns, maintains, or simply pays for electricity for street lights varies from place to place, and impacts whether the city or utility, or competitive retailer, will save from an investment in lighting retrofits. This often creates a split of benefits that prevents cities and/or utilities from investing in high efficiency lights. For example, in the vertically integrated utility markets, the utilities could work to create rate structures for street lighting technology that is cost effective for cities. For those utilities in the restructured markets, their tariff should accurately reflect the upfront

and maintenance costs, dependent on ownership and maintenance agreements with the individual cities. The cities in the restructured markets will see the reduction in energy consumption associated with new street lighting technology on their electric bill from their retail electric provider.

RECOMMENDATION:

Cities need to work with their utilities to inventory equipment, determine equipment ownership, as well as existing maintenance agreements. The cities and utilities will then need to work together to determine the most cost effective and energy efficient retrofit project. Simply having accurate inventory and identifying the most inefficient lamps within a given city can help move lighting retrofits forward, helping reduce energy consumption and lower electricity bills.

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For more information on the issues in this report, and to access presentations and white papers presented to the Commission and used to inform these recommendations, please visit:

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