



Glenn Hegar
Texas Comptroller of Public Accounts

Facility Preliminary Energy Assessments and Recommendations

for



City of Hilshire Village

8301 Westview Dr
Houston, TX 77055

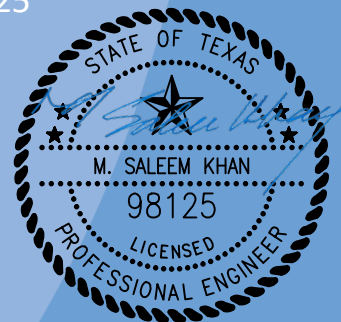
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Schools & Local Governments Energy Management Program

City of Hilshire Village

8301 Westview Dr.

Houston, TX 77055

Contact Person: Susan Blevins, City Administrator/Secretary

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Executive Summary

The City of Hilshire Village, now referred to as the City, requested that Texas Energy Engineering Services, Inc. (TEESI) perform a Preliminary Energy Assessment (PEA) of their City Hall facility. This report documents that analysis along with considerations for street light LED retrofits. A copy of the signed SECO service request form (Form# 50-855) is included in Appendix E.

This service is provided at no cost to the City through the Schools and Local Governments Energy Management Program as administered by the Texas Comptroller of Public Accounts, State Energy Conservation Office (SECO). This program promotes and encourages an active partnership between SECO and Texas local governments for the purpose of planning, funding, and implementing energy and water saving measures, which will ultimately reduce the City’s annual utility costs. The annual cost savings; energy savings; implementation cost estimate; and simple payback for all Utility Cost Reduction Measures (UCRM’s) identified in this preliminary analysis are summarized in Figure 1 below. Individual UCRM’s are summarized in Section IX of this report.

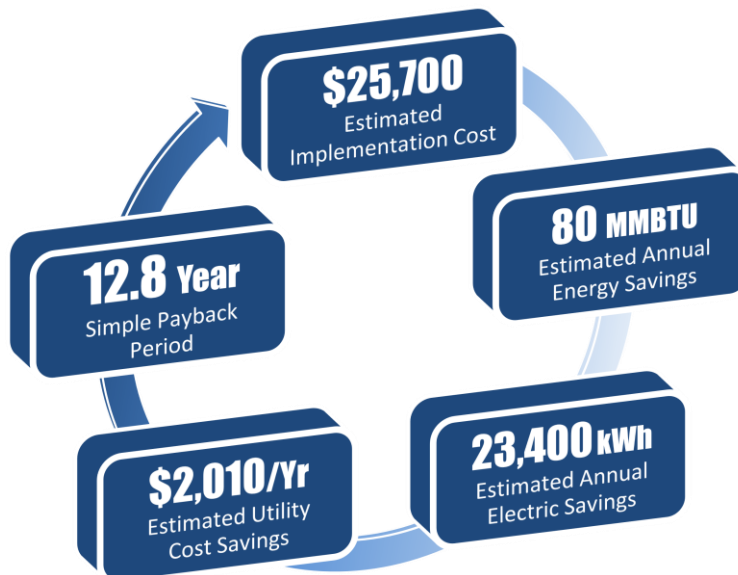
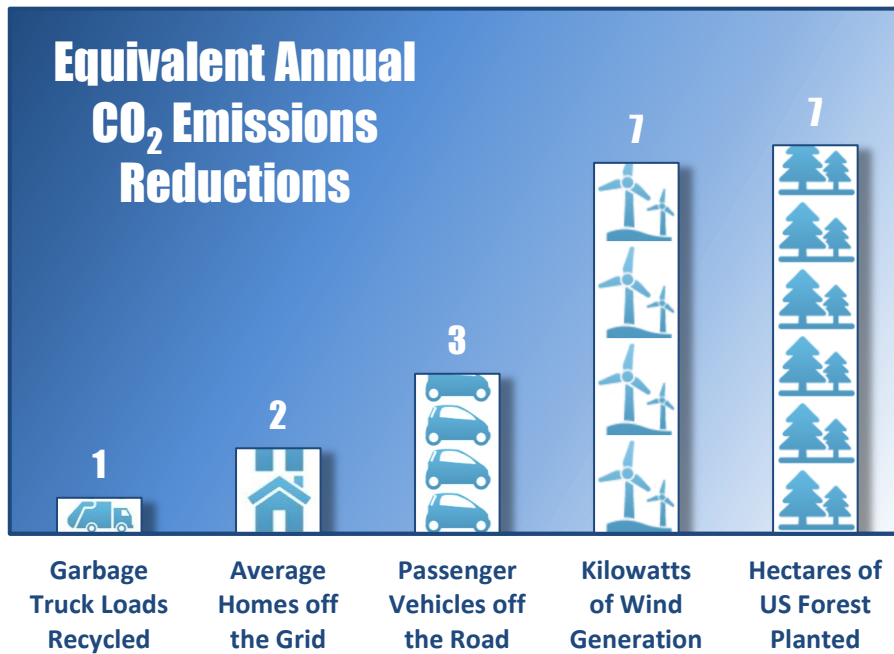


Figure 1. Cost and savings summary for UCRMs identified.



In addition to energy and cost savings, the potential projects identified also represent a commitment to environmental sustainability through a resulting reduction in greenhouse gas emissions equivalent. Implementation of the measures identified in this report could reduce the City’s carbon footprint by an estimated **14 Metric Tons of CO₂ per year**. Figure 2 below demonstrates the scale of this potential reduction in every-day terms.



Based on estimated potential GHG reduction and reference calculations found at <https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references>

Figure 2. Potential Annual UCRM CO₂ reduction equivalencies.

This report includes a summary of the survey along with baseline energy consumption and costs, opportunities for savings, and information regarding energy management and options for funding retrofit projects. A meeting with the City will be scheduled to address any questions pertaining to this report, or any other aspect of this program.

SECO is committed to providing whatever assistance the City may require in planning, funding, and implementing the recommendations of this report. The City is encouraged to direct any questions or concerns to either of the following contact persons:

SECO / Ms. Margaret Garcia (512) 463-1947

TEESI / Saleem Khan, P.E. (512) 328-2533



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I. Facility Description

This section provides a brief description of the facility surveyed. The purpose of the on-site survey was to evaluate the City's major energy consuming equipment (i.e. Lighting, HVAC, and Controls thereof). The City Hall was chosen for the preliminary assessment. Figure 3 shows the geographic location of the facility, with a summary on the following page.

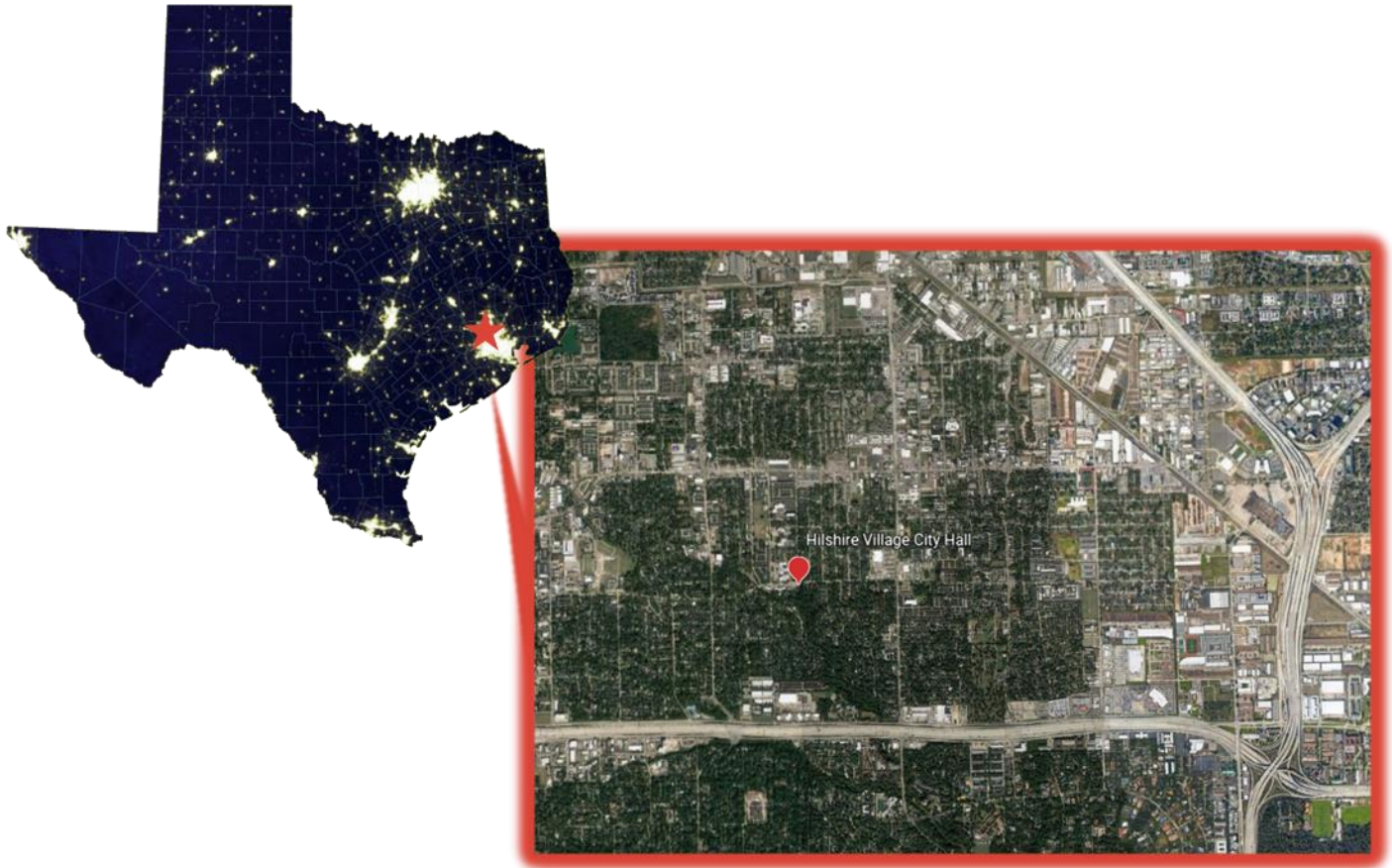


Figure 3. The City of Hilshire Village PEA facility location.



City of Hilshire Village

Schools and Local Government Energy Management Program Preliminary Energy Assessment

City Hall



Area (Estimated)	2,200 ft ² .
Building Components	Brick building, pitched shingled roof.
Typical Lighting Fixtures	T8 linear fluorescent fixtures in offices and hallways, High Intensity Discharge (HID) fixtures in the courtroom, LED exterior wall packs.
HVAC	Split DX units with natural gas heating.
Controls	Programmable Thermostats.



II. Energy Consumption and Performance

A site survey was conducted at the City Hall facility. Annual electric and natural gas invoices for the building were approximately \$1,300 for the 12-month period ending February 2021. A summary of annual utility costs is provided in **Appendix C**, Base Year Consumption History.

To help the City evaluate the overall energy performance of its facility, TEESI has calculated their Energy Utilization Index (EUI) and Energy Cost Index (ECI). The EUI represents a facility’s annual energy usage per square foot; it is measured in thousands of BTUs per square foot per year (kBtu/ft²/Year). Similarly, ECI is measured as cost per square foot per year (\$/ft²/Year). The EUI and ECI for the facility are summarized in Table 1 below.

Table 1. Building Energy Cost and Consumption Benchmarks

Facility Name	Approx. ft ²	Electric kWh/Yr	Electric kWh/ft ² /Yr	Electric \$Cost/Yr	Heat'g Fuel MMBTU/Yr	Heat'g Fuel kBtu/ft ² /Yr	Heat'g Fuel \$Cost/Yr	Total MMBTU/Yr	Total \$Cost/Yr	EUI kBtu/ft ² /Yr	ECI \$/ft ² /Yr
City Hall	2,200	10,265	4.7	\$878	27	12.2	\$398	62	\$1,276	28.1	\$0.58
TOTAL	2,200 ft ²	10,265 kWh/Yr	4.7 kWh/ft ² /Yr	\$878 Electricity	27 MMBTU/Yr	12.2 kBtu/ft ² /Yr	\$398 Heating Fuel	62 MMBTU/Yr	\$1,276 Energy	28.1 kBtu/ft ² /Yr	\$0.58 per ft ² /Yr

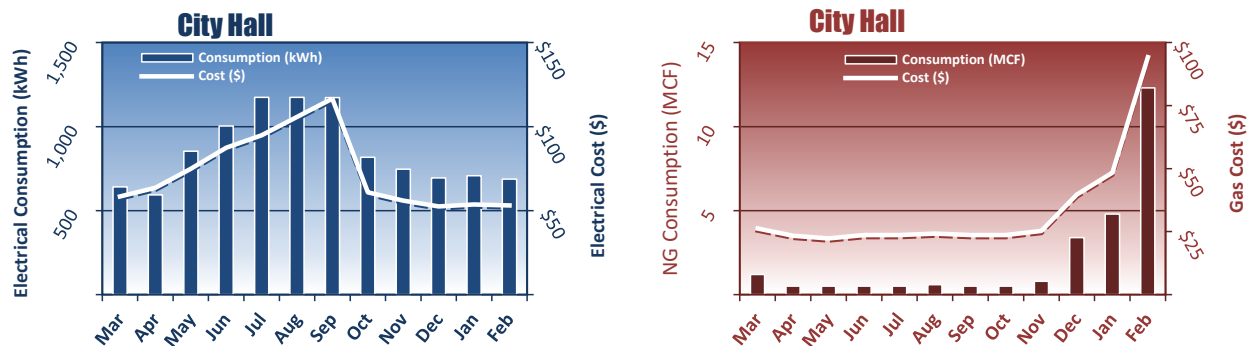
1) All heating fuel consumption converted to MMBTU heat input using factors 1 MCF = 1.03 MMBTU for natural gas.

The readily available utility consumption and cost data from the table above is intended as a summary of the facility and was gathered from the City’s utility provider’s physical bills. The facility square footage is shown as provided by the City. Please note, the performance metrics for the facility shown above may be affected by the COVID-19 coronavirus. The metrics may differ when compared to a year with normal occupancy, operations, and schedules. See **Appendix C** for further baseline utility data detail.

Knowing the EUI and ECI of a facility is useful to help determine the City’s overall energy performance. In addition, the City’s EUI was compared to TEESI’s database of Texas government buildings. See **Appendix D** to determine how the EUI of this facility compared to those of other entities in Texas.

The following charts summarize the facility’s monthly utility data.

Figure 4. Energy consumption and cost base year for City Hall.





III. Water Consumption Considerations

The following are some general recommendations for water conservation measures, some of which may already be under consideration by the City. This is intended only as a general starter guide.

Low Flow Plumbing Fixtures – Low flow aerators on existing sinks and low flow shower heads can yield significant water savings. In addition, existing toilets and urinals may be retrofitted with low gallon-per-flush fixtures. These retrofits typically have simple paybacks of 5-10 years.

Central Irrigation Control – Smart irrigation controls may be installed on existing City irrigation systems. These systems can offer the following water-saving features:

Weather-based irrigation: The systems will water on-demand depending on prevailing weather conditions and plant evapotranspiration data, thereby eliminating unnecessary irrigation associated with standard constant or manually adjusted watering schedules.

Networked Flow Sensors: Flow sensors installed on irrigation feeds at different locations allow for remote monitoring of individual site water usage. This can in turn facilitate more strategic targeting of high use sites for further curtailment measures, as well as early detection of potential leaks and system malfunctions.

Master Flow Shutoff Valves: Along with flow sensors, master shutoff valves for irrigation systems and other main water lines may be controlled remotely. This allows for automatic leak detection and shutoff so that the problem may be fixed with little to no wasted water.

Water-conscious Design – The City should make water-efficient design a standard practice for all new construction projects. Designing for water efficiency from the very beginning will have a greater impact on future consumption and will allow for more extensive measures such as plumbing for air-conditioning condensate capture and reuse, rainwater collection, etc.

Consumption Tracking – Utilities tracking databases such as ENERGY STAR Portfolio Manager and spreadsheet applications may be used to monitor and track the City's water usage over time.



IV. ENERGY STAR Portfolio Manager

TEESI has imported the City’s utility data into ENERGY STAR Portfolio Manager. One of the key reasons for using Portfolio Manager is its ability to normalize the City’s baseline according to several key factors (i.e. Weather, Square Feet, Hours of Operation, Number of Computers, etc.). It is also a free online resource available to all registered users and is a user-friendly web-based tool.

ENERGY STAR is a joint program of the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE). ENERGY STAR has developed Portfolio Manager, an innovative online energy management tool, designed to help organizations track and assess energy and water consumption of their facilities. Portfolio Manager helps organizations set investment priorities, identify under-performing buildings, verify efficiency improvements, and receive EPA recognition for superior energy performance.

Portfolio Manager is an energy performance benchmarking tool. Portfolio Manager rates a building’s energy performance on a scale of 1–100 relative to similar buildings nationwide. The rating system is based on a statistically representative model utilizing a national survey conducted by the Department of Energy’s Energy Information Administration. This national survey, known as the Commercial Building Energy Consumption Survey (CBECS), is conducted every four years, and gathers data on building characteristics and energy use from thousands of buildings across the United States. A rating of 50 indicates that the building, from an energy consumption standpoint, performs better than 50% of all similar-use buildings nationwide, while a rating of 75 indicates that the building performs better than 75% of all similar-use buildings nationwide.

In addition, Portfolio Manager is used to generate a Statement of Energy Performance (SEP) for each building, summarizing key energy information such as site and source energy intensity, greenhouse gas emission, energy reduction targets and energy cost. The Statement of Energy Performance can be used in applying for an ENERGY STAR Building label or satisfying LEED for Existing Buildings (LEED-EB) requirements. ENERGY STAR certification, as well as the LEED-EB Minimum Energy Performance Prerequisite, both require an ENERGY STAR score of at least 75. **Note that SEP verification for purposes of ENERGY STAR certification includes additional requirements such as on-site confirmation of building space use data and compliance with lighting, ventilation, and other building codes.**

To develop the City’s baseline, 12 months of utility consumption, cost data, and Building Space Use information is required. Table 2 is a sample of the Building Space Use data required by Portfolio Manager to generate the Energy Performance Rating. Many of these inputs are critical, may vary over time, and can significantly influence how Portfolio Manager computes the ENERGY STAR Rating. If an ENERGY STAR Label is pursued, these key inputs will need to be verified and certified by a Portfolio Manager Licensed Professional (Professional Engineer or Registered Architect).

Table 2. ENERGY STAR Portfolio Manager Example Space Use Data

Facility Type: Office	
<ul style="list-style-type: none"> • 12 Months of energy consumption data • Gross floor area • Weekly Operating Hours • # of PCs 	<ul style="list-style-type: none"> • Number of workers on main shift • Percent cooled • Percent heated



The City Hall Received an ENERGY STAR Score of 89 for the base year ending in February 2021. Please note this score is based on Portfolio Manager system defaults for the input data summarized in Table 2. These values will need to be updated with actual facility data for a more accurate rating, and to pursue any ENERGY STAR certification (SEP generation, licensed professional on-site verification, and code compliance confirmation requirements would also apply as discussed). The target for any building is a rating of 75 to qualify for the ENERGY STAR certification.

A benefit of using ENERGY STAR's Portfolio Manager is its ability to set goals. It allows an energy performance target to be set for each facility and calculates the estimated savings per year required to reach the goal. It should be noted that just because a facility is at or above an ENERGY STAR Rating of 75 or higher does not mean there are not additional opportunities for energy savings. A proper energy management program should of course still be applied to the entire City.

Please see Appendix H for additional information regarding ENERGY STAR PORTFOLIO Manager.



V. Energy Accounting

Utility Providers

Hudson Energy provides electric service to the City. CenterPoint Energy provides Natural Gas service to the City.

Monitoring and Tracking

Currently, the City does not have a spreadsheet in place to track electricity, gas, and water consumption as well as costs. An effective energy tracking system is an essential tool by which an energy management program's activities are monitored. The City should consider tracking demand, where applicable, of the City's utilities as well. The system should be centralized and available for all engaged staff members to use in verifying progress toward established targets and milestones. Having this historical data improves awareness of energy performance and will help in tracking energy reduction goals.

The steps below are essential for an effective energy management tracking system:

1. Perform regular updates. An effective system requires current and comprehensive data. Monthly updates should be strongly encouraged.
2. Conduct periodic reviews. Such reviews should focus on progress made, problems encountered, and potential rewards.
3. Identify necessary corrective actions. This step is essential for identifying if a specific activity is not meeting its expected performance and is in need of review.

In addition, having this historical utility data would facilitate any legislative reporting requirements. Please see Section VII for additional information regarding these requirements.

Preferably, the City should also consider an electronic database such as ENERGY STAR Portfolio Manager, which will provide a means of storing and tracking utility information. For more information on ENERGY STAR Portfolio Manager, please see Section IV.



VI. Average Utility Rates

Table 3 below shows average per-unit consumption rates for the City’s utility service. This figure gives a general idea of cost implications for every unit of energy consumed or saved. However, this “blended” average rates also include various service charges, peak demand charges, and power factor penalties that can potentially be addressed individually to save costs without necessarily reducing consumption. For a detailed investment grade audit, if one is pursued, an in-depth rate analysis with individual costs per avoided kWh and kW would be required and conducted.

Table 3. Utilities Average Per-Unit Consumption Rates

Facility	Electricity ¹ \$/kWh	Fuel ² \$/MMBTU
<i>City Hall</i>	\$0.085	\$14.81

(1) Electric Provider: Hudson Energy

(2) Natural Gas Provider: CenterPoint Energy



Electrical Demand

The City’s utility provider charges for Transmission and Distribution, also known as demand or kW charges, in addition to consumption (kWh). The City paid \$434 in electric demand charges over the 12-month period ending February 2021. This comprised over 49% of total electricity costs during this time. It should be noted that this is higher than typically seen across Texas but may be due to the relatively low energy consumption at this facility. Please note that demand data was not available for October 2020 – February 2021, and the data is shown as provided by the City’s utility provider.

Demand (kW) charges stem from a facility's peak power draw during a billing period, as opposed to consumption (kWh) charges, which total the energy usage over this period. The following plot shows the metered demand and demand charge over a 12-month period for the facility.

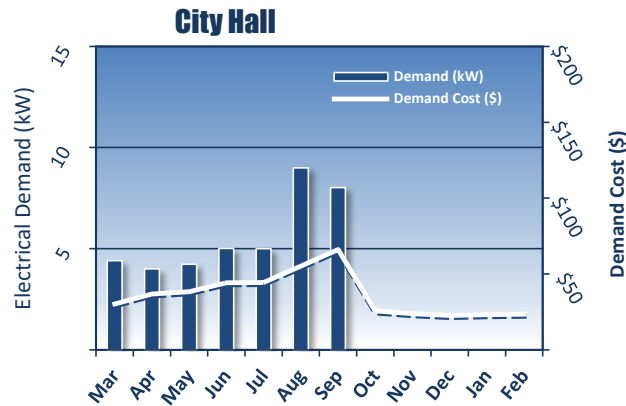


Figure 5. City Hall baseline kW demand data.

Billable Demand Adjustments

Note that the monthly demands shown in the previous charts are *metered* demand, whereas charges are often applied to a *billable* demand. The following describe typical electric rate provisions that affect billable demand, and thus total costs. It was not noted that the City’s facility was subject to any demand adjustments, but the following is included for reference in the event that the billing structure changes in the near future.

80% Ratchet

The 80% ratchet computes the larger of the metered kW in the billing period or 80% of the highest metered demand in the previous 11 months. This is essentially a penalty for the rest of the year when only one month experiences a "spike" in demand. It is therefore essential that the City try to manage demand peaks month to month to avoid penalties in the future.



Power Factor

The power factor is equal to the ratio of the actual power being used by a facility to the apparent power that the utility provider must make available. When the apparent power (kVA) demand from the provider is significantly greater than what is actually necessary, the power factor is low, and a penalty is incurred.

Load Factor

For analyzing a facility's electrical demand from month to month, it is useful to calculate the load factor. The load factor is equal to the average demand divided by the peak demand for a given period and represents the consistency of a facility's energy usage. That is,

$$\text{Average kW in billing period} = \frac{\text{Total kWh in billing period}}{\text{Hours in billing period}}$$

$$\text{Load Factor} = \frac{\text{Average kW in billing period}}{\text{Peak kW in billing period}}$$

Typical load factors vary depending on facility type and operating hours, as well as season and building efficiency. An average value for a single-shift building is around 30%. In general, an excessively low load factor means higher demand peaks than total consumption would indicate, and thus higher than necessary demand charges. Excessively high load factors indicate more constant energy usage, suggesting equipment is not being shut down when it could be. The following plot show the monthly load factors at each applicable facility.

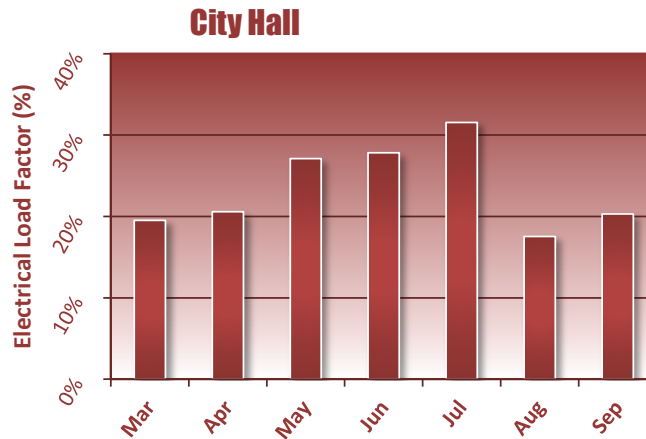


Figure 6. City Hall baseline electrical load factor data.

Note: October 2020 - February 2021 had zero metered demand and so load factor could not be calculated for those months.



VII. Energy Legislation Overview

In 2011, the 82nd Texas Legislature passes Senate Bill 898 (**SB898**) which, among other things extended the timeline set by Senate Bill 12 (**SB12**) and its predecessor Senate Bill 5 (**SB5**). SB5, commonly referred to as the Texas Emissions Reduction Plan, was adopted in 2001 by the 77th Texas Legislature to comply with the federal Clean Air Act standards. Also in 2011, the 82nd Texas Legislature passed Senate Bill 924 (**SB924**), which continued House Bill 3693 (**HB3693**) amending provisions of several codes relating primarily to energy efficiency.

Following are key requirements established by the above energy legislation:

- Establish a goal to reduce electrical consumption by 5 percent each year for ten years, beginning September 1, 2011.
- Implement all cost-effective energy efficiency measures to reduce electric consumption (Cost effectiveness is interpreted by this legislation to provide at least a 20-year return on investment).
- Report annually to the State Energy Conservation Office on the entity's progress, efforts, and consumption data.
- Record electric, water, and natural gas utility services (consumption and cost) in an electronic repository. The recorded information shall be on a publicly accessible Internet Web site with an interface designed for ease of navigation if available, or at another publicly accessible location.
- Purchase commercially available light bulbs using the lowest wattages for the required illumination levels.
- Install energy saving devices in Vending Machines with non-perishable food products.

Summary descriptions of SB898 and SB924 are available in **Appendix A**.



VIII. Recommended Maintenance & Operation Procedures

Good Maintenance and Operation procedures significantly improve operating economy, equipment life, and occupant comfort. Generally, maintenance and operation procedural improvements can be made with existing staff and budgetary levels. Below are typical maintenance and operation procedures that have energy savings benefits. The City may already be following some of the recommendations noted below. The following maintenance and operation procedures should be encouraged and continued to ensure sustainable energy savings.

Conduct a Nighttime Audit

Conduct a nighttime audit to see what is left on afterhours that should not be. This can be done either through a physical walkthrough or through placement of data loggers and subsequent review of overnight data. After the initial audit and correction, once it is determined what the unoccupied base load *should* be, ongoing monitoring of building electrical service could potentially be implemented to ensure persistence of these savings.

Publicize Energy Conservation

Promote energy awareness at regular staff meetings, on bulletin boards, and through organizational publications. Publicize energy cost reports showing uptrends and downtrends. Such publicity has been shown to effect behavioral changes in organization staff, ultimately conserving even more energy.

Manage Small Electrical Equipment Loads

Small electrical equipment loads consists of small appliances/devices such as portable heaters, microwaves, small refrigerators, coffee makers, stereos, cell phone chargers, desk lamps, etc. The City should establish a goal to reduce the number of small appliances and to limit their usage. For example, the use of small space heaters should be discouraged; all space heating should be accomplished by the City's main heating system. In addition, many small devices such as radios, printers, and phone chargers can consume energy while not in use. To limit this "stand-by" power usage these devices should be unplugged or plugged into a power strip that can act as a central "turn off" point while not in use. With an effective energy awareness campaign to encourage participation, managing small electrical loads can achieve considerable energy savings.

Establish HVAC Unit Service Schedules

Document schedules and review requirements for replacing filters, cleaning condensers, and cleaning evaporators. Include particulars such as filter sizes, crew scheduling, contract availability if needed, etc. Replace filters with standard efficiency pleated units. Generally, appropriate service frequencies are as follows -- filters: monthly; condensers: annually; evaporators: every 5 years.



Pre-Identify Premium Efficiency Motor (PEM) Replacements

Pre-identify supply sources and PEM stock numbers for all HVAC fan and pump motors so that as failures occur, replacement with PEM units can take place on a routine basis. As funding allows pre-stock PEM replacements according to anticipated demand, i.e., motors in service more than 10 years, motors in stressful service, and at least one motor of each size and type that is in service at numerous locations. The City currently has premium efficiency motors installed at their lift station. These motors are rated at the IE3, the current premium efficiency standard.

For small single-phase motors (less than 1 HP) such as on small split-unit indoor blowers, condenser fans, and restroom exhaust fans, many manufacturers are beginning to offer Electrically Commutated (EC) motors for the application. EC motors are brushless Direct Current (DC) motors that offer around 30% efficiency improvement over Permanent Split Capacitor (PSC) motors and up to 60% improvement over shaded pole motors. When replacing existing failed motors of these types, it is recommended to consider EC motor replacement, which has a typical payback of 3-6 years over PSC alternatives.

Improve Control of Interior and Exterior Lighting

Establish procedures to monitor use of lighting at times and places of possible/probable unnecessary use: Offices at lunchtime, closets, exterior, and parking lots during daylight hours, etc. Encouraging staff to participate in the City's efforts to limit unnecessary lighting use would help improve this effort. Turning many lights on at once also increases electric demand and costs. Using motion sensors to control building lighting is an optimum solution and is discussed further in **Section X Capital Improvements**.

Exterior lighting is typically controlled using light sensing photocells, timeclocks, or manual switching. Photocells tend to fail in the "On" state, so someone should check regularly to see that the lights are not on during the day. Photocells can also drift out of calibration, causing exterior lighting to be left on in only slightly overcast conditions. Timeclocks are more reliable, and those with astronomical control or that operate in series with photocells also provide dusk-to-dawn operation that is seasonally corrected. Timeclocks also offer the option of turning off the lights in the middle of the night. Manual control is limited to when someone is present and remembers to actuate the switch.



Schedule HVAC Equipment Operation Based on Building Occupancy

The City hall currently uses programmable thermostats that are scheduled based on occupancy. The split dx units are scheduled for 8:00 am – 6:00 pm, Monday – Friday, with setback setpoints in place on the weekends. Figure 7 below shows the schedule on a programmable thermostat at the City Hall. This start/stop schedule is implemented on all thermostats at the City Hall and is based on actual building occupancy.



Figure 7. Programmable Thermostat schedule at the City Hall.

Maintain Optimum Cooling, Heating, and Setback Setpoints

The City currently maintains cooling setpoints for the City Hall at 74°F, with heating setpoints offset 4°F. The City is to be commended for using standardized setpoints that allow a sufficient deadband between heating and cooling modes. An occupied cooling setpoint of 74°F and heating setpoint of 68°F are typically recommended by most energy codes, with unoccupied setback to 85°F in cooling and 55°F in heating. Figure 8 shows the setpoints during occupied times (weekday schedule) and the setback setpoints during unoccupied times (the weekend schedule). Further discussion of thermostat setpoints as an energy conservation policy is discussed in Section XI.



Figure 8. HVAC operation setpoints for the occupied week-day schedule (left), Setback setpoints for the unoccupied week-end schedule (right).



Typical Equipment Maintenance Checklists

Effective operation and maintenance of equipment is one of the most cost-effective ways to achieve reliability, safety, and efficiency. Failing to maintain equipment can cause significant energy waste and severely decrease the life of equipment. Substantial savings can result from good operation and maintenance procedures. In addition, such procedures require little time and cost to implement. Examples of typical maintenance checklists for common equipment are provided in **Appendix F**. These checklists from the Federal Energy Management Program (FEMP), a branch of the Department of Energy (DOE), are based on industry standards and should supplement, not replace those provided by the manufacturer.

MERV Ratings for Air Filters

The American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) has developed a measurement scale for air filters. This rating is called the Minimum Efficiency Reporting Value, or MERV rating. MERV ratings range from 1 to 16 for most applications. The lower MERV ratings will allow larger particles to pass through the air filter, whereas the higher MERV ratings will only allow much smaller particles to pass through. Air filters with higher MERV ratings will cost more but can also offer greater protection for the occupants and protect HVAC equipment from excessive dust/particulate build up. MERV ratings and applications summarized in the following table.

Table 4. Minimum Efficiency Reporting Value (MERV) Ratings (*)

MERV Std 52.2	Average Arrestance	Particle Size Ranges	Typical Applications
1 - 4	60 - 80%	> 10 µm	- Minimum filtration - Residential window units
5 - 8	80 - 95%	3.0 - 10 µm	- Better Residential - Commercial buildings
9 - 12	>90 - 98%	1.0 - 3.0 µm	- K-12 Schools - Better commercial buildings - Hospital laboratories
13 - 16	>95 - 99%	0.3 - 1.0 µm	- K-12 Schools - Hospital inpatient care - General Surgery

(*) Source: Understanding MERV NAFA User’s Guide for ANSI/ASHRAE Standard 52.2-2017 Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size – 2017)

In general, the City should consider air filters with minimum MERV ratings of 9-13 to improve indoor air quality if it does not adversely impact HVAC system operation. It is essential that an HVAC system(s) analysis be done to ensure HVAC unit can handle higher MERV filters.



Control Outside Air Infiltration

Conduct periodic inspections of door and window weather-stripping, as well as other building envelope penetrations, and schedule repairs when needed. Additionally, make sure doors and windows are closed during operation of HVAC systems (heating or cooling). Unintended outside air contributes to higher energy consumption and increases occupant discomfort.

Replace Incandescent Lamps with LEDs

Replace existing incandescent lamps with LED bulbs as they burn out. LED bulbs use 75 to 90% less wattage for the same light output, with more than ten times the operating life of incandescents. Look for personal lamps, desk lamps, task lamps, floor lamps, mood lighting and rope lights and ensure LED lights are being used.

Install LED Exit Signs

Exit signs operate 24/7, 365 days per year. LED exit signs use around 2-5 Watts per fixture and replacing the older, existing signs will have immediate energy savings of around 90% per sign.

Energy Star Power Management

ENERGY STAR Power Management Program promotes placing monitors and computers (CPU, hard drive, etc.) into a low-power “sleep mode” after a period of inactivity. The estimated annual savings can range from \$25 to \$75 per computer. ENERGY STAR recommends setting computers to enter system standby or hibernate after 30 to 60 minutes of inactivity. Simply touching the mouse or keyboard “wakes” the computer and monitor in seconds. Activating sleep features saves energy, money, and helps protect the environment.

Hail Guards on Condensing Coils

When an HVAC unit is replaced, the City should ensure the new unit be specified with hail guards as shown in Figure 9. The hail guards protect the condensing unit’s heat exchanger coils from hail damage. Damage to the condensing unit heat exchangers reduces the efficiency of the units. Condensing coil fins may be straightened using a fin comb.



Figure 9. Hail guards on Split-DX units at the City Hall.

Inspect and Repair Insulation on Refrigerant Lines

During the site visits it was noted that refrigerant lines have well maintained insulation. Proper insulation minimizes heat transfer on the line and increases system efficiency. Figure 10 shows an example of well-maintained insulation at the City Hall.



Figure 10. Well maintained insulation on refrigerant lines at the City Hall.



IX. Utility Cost Reduction Measures

Utility Cost Reduction Measures (UCRMs) projects identified during the preliminary analysis are detailed below. Project cost estimates include complete design and construction management services. It should be noted that the City has already performed some energy saving retrofits such as exterior LED lighting. By requesting this study, the City has demonstrated interest in taking a more aggressive approach to energy management.

Replace Existing Interior Lighting with LEDs

The City primarily uses 32-Watt (W) T8 linear florescent lamps in most offices and common areas, with High Intensity Discharge (HID) fixtures in the courtroom. The HID fixtures can be retrofitted with LED bulbs suitable for the application and T8 linear fluorescent fixtures can be retrofitted with high efficiency LED tube retrofits using between 12-15W per lamp. These LED lamps match standard T8 linear fluorescent dimensions and can be installed in existing fluorescent fixtures. Currently, there are three LED tube retrofit options which are commonly referred to as Type A, B, and C.

The Type A retrofit involves installing “plug and play” LED tubes which can be installed in existing fluorescent fixtures with no rewiring required, if existing electronic ballasts are in good shape. This retrofit is typically the quickest and cheapest option, although this is heavily dependent on existing ballast compatibility and age. Some downsides are that typical ballast replacements will still be required throughout the equipment lifetime, and there are limited lighting control abilities such as dimming. If a significant portion of ballast replacements are required due to age or compatibility issues, this option would not be recommended as the installation cost will increase to be comparable with the Type B retrofit.

The Type B retrofit involves installing LED tubes with integrated drivers, which requires rewiring the fixture to bypass the existing ballast. Some downsides are that Type B retrofits will have a higher installation cost due to the labor required for rewiring each fixture, and special care must be taken in lamp replacements in the future as wiring configuration may vary across manufacturers. The Type C retrofit involves installing LED tubes and requires fixture rewiring by removing the existing fluorescent ballast and installing a dedicated LED driver. Overall, the type C retrofit is the most expensive option, but also offers the most precise dimming capabilities and additional control functionality.

The estimated costs and savings in Table 5 are based on replacement of existing 32W T8 lamps with approximately 12-15W LED tubes, i.e., Type B LED retrofit, as well as replacing the HID courtroom lighting with approximately 25W LED bulbs. Please note that some or all of this retrofit can be done “in-house” without the use of lighting contractors. Alternatively, the City could consider a Type A “Plug and Play” retrofit, but the existing ballast compatibility would need to be confirmed prior to installation. Estimates are based on a preliminary walkthrough of the facility. It should be noted that the estimated implementation costs include material, labor, design, markup, and lamp recycling.



Table 5. Interior LED Lighting Retrofit

Facility	Estimated Implementation Cost (\$)	Estimated Annual Savings (\$/Yr)	Estimated Annual MMBTU Savings	Simple Payback (Yrs)
City Hall	\$1,500	\$210	8	7.1
INTERIOR LED RETROFIT SUMMARY	\$1,500 <i>Est. Cost</i>	\$210 <i>Est. Savings</i>	8 <i>MMBTU</i>	7.1 <i>Year Payback</i>

Street Light LED Retrofit

It is recommended to retrofit existing street lighting with higher efficiency LED lamps. The City’s High Intensity Discharge (HID) street lighting primarily consists of High Pressure Sodium (HPS) bulbs. In addition to operating at lower wattage, these retrofits also have the advantage of shorter strike time, longer lamp life, and better color rendering index while still meeting IES foot-candle levels for the areas served. Replacements should be selected to maintain adequate light levels post-retrofit. A detailed lighting analysis will be required to determine exact cost, quantities, and configuration to maximize energy savings and lighting performance.

Table 6 shows estimated costs and savings for retrofitting existing area lights (one-to-one replacement of fixture heads reusing existing poles). Note that the savings in Table 6 do not include potential lamp replacement cost savings, which can make for more attractive return on investment. This is a preliminary avoided replacement cost estimate only and would depend on current lamp/ballast failure rates and material/labor costs to the City for replacement.

Table 6. Streetlight HID to LED Retrofit

Facility	Estimated Implementation Cost (\$)	Estimated Annual Savings (\$/Yr)	Estimated Annual MMBTU Savings	Simple Payback (Yrs)
Street Lights	\$24,200	\$1,800	72	13.4
STREET LIGHT LED RETROFIT SUMMARY	\$24,200 <i>Est. Cost</i>	\$1,800 <i>Est. Savings</i>	72 <i>MMBTU</i>	13.4 <i>Year Payback</i>



UCRM Project Summary

Table 7 summarizes the implementation costs, annual savings, and simple payback for the preceding projects. The projects' implementation costs and annual savings are estimated based on a preliminary examination of the facility. Final project costs would be determined from engineering calculations and contractor estimates. Potential rebate money from utility-sponsored efficiency programs could also be evaluated during project planning phase but is not included in the table below. Project design (drawings and specifications), if authorized, would normally be accomplished by professional engineers. Project acquisition (competitive bidding) would be in accordance with City requirements, and construction management would be provided by the engineering group who prepared the drawings and specifications. Alternatively, the City could also consider implementing some of the recommendations "in-house."

Table 7. Utility Cost Reduction Measure Summary

Project Description	Estimated Implementation Cost (\$)	Estimated Annual Savings (\$/Yr)	Estimated Annual MMBTU Savings	Estimated Annual kWh Savings	Simple Payback (Yrs)	Estimated Useful Life (Yrs)
Interior LED Retrofit	\$1,500	\$210	8	2,400	7.1	10
Street Light LED Retrofit	\$24,200	\$1,800	72	21,000	13.4	15-20
PROJECT TOTAL	\$25,700	\$2,010	80	23,400	12.8	EUL
SUMMARY	<i>Est. Cost</i>	<i>Est. Savings</i>	<i>Est. MMBTU</i>	<i>Est. kWh</i>	<i>Year Payback</i>	<i>Years</i>



X. Capital Improvement

This section is intended to describe the capital improvement projects that have energy savings opportunities but cannot be justified solely based on the potential energy savings alone.

Install Occupancy Sensors

The City should consider installing occupancy sensors to improve control of interior lighting. Occupancy sensors will help ensure lights are only on when the space is occupied. It is estimated the cost of installation for occupancy sensors at the City hall is approximately \$1500 - \$2000. Please note these *estimates are based on a preliminary assessment and may not payback on energy savings alone*. Exact sensor locations, technology (Infrared, Ultrasonic, etc.) and quantity can be determined during a detailed energy assessment or design phase. In general, enclosed areas with intermittent use are typically good candidates (e.g. offices, break rooms and conference rooms).

Wi-Fi Thermostat

It was noted that the City Hall HVAC units rely on scheduled programmable thermostats. It is recommended that the City consider installing web-based, networked thermostats to provide improved control of the air conditioning systems. Networked thermostats are a good option for facilities where limited unit controls such as start/stop, and scheduling is desired. Networked thermostats will also allow for remote temperature adjustments and could be monitored remotely using a web-based portal.



Solar PV Considerations

Currently, the City has no roof mounted solar arrays at of their facility. Due to shading concerns and the small, pitched roof solar installations are not recommended at the City Hall. However, a preliminary sample analysis is provided if the City were to purchase additional facilities in the future.

A preliminary Solar PV analysis was performed for a sample 20-kW solar panel array. Roof quality inspections should be performed when assessing solar feasibility. Solar PV array installation are intended to generate electricity during peak operating times, resulting in lower electricity (kWh) purchased from the utility.

PV Watts, an online tool provided by the National Renewable Energy Laboratory (NREL), was used in estimating electric generation and associated energy savings. The analysis is based on a fixed, roof mounted solar panel array. Assumptions must be made for PV array tilt based on site specific operations. Local weather data was used in the analysis (Hilshire Village, TX – 29.77° N Latitude, -95.5° W Longitude).

Roof areas should be selected for "ideal" conditions for PV arrays, that is unobstructed roof areas with no shading issues. For reference, a 20-kW system would require approximately 1,300 square feet of unobstructed roof space. The following table shows a breakdown of the monthly electric generation from the solar panel array based on the PV Watts calculator, as well as the savings based on the City’s average utility rate.

Table 8. Sample Solar Generation Breakdown for a 20-kW.

Table with 3 columns: Month, AC System Output (kWh), and Estimated Value (\$). Rows include months from January to December and a Total row.

Estimated costs and savings for the installation of the solar panel array are approximately \$45,000. This results in an estimated project payback of 19 years.



The cost and payback represented above do not include potential rebate(s) from the Utility Service Provider; the City should consult with a Utility representative for possible rebates. Cost estimates are based on a report published in September 2018 by NREL, titled [U.S. Photovoltaic System Cost Benchmark: Q1 2018](#), plus adjustment for site conditions. Cost estimates include hardware (module, inverter, rack, balance of systems), installation labor, and EPC (engineering, procurement, and construction) overhead and development costs. The estimated lifetime of a solar panel arrays is around 25 years. Site specific cost considerations such as structural load analysis and extreme-weather-rated roofing mounts must also be considered in the design phase.

It should be noted that due to the extended payback of Solar PV arrays, it is recommended that the City consult with roof quality contractors to determine the quality and estimated remaining useful life of any roofs where solar is proposed. It is not recommended to install Solar PV arrays if the roof is planned for replacement before the payback of the Solar PV arrays. Having PV arrays on the roof would significantly increase the cost of roof replacements as all the arrays would have to be removed from the roof and reinstalled following roof construction completion. A detailed level analysis would be used to determine exact solar PV array configuration, solar PV panel selection, inverter selection, costs, kWh reduction, monthly peak demand reduction, and resultant savings. Installing a solar panel array would likely reduce the peak monthly demand (kW) with appropriate demand management strategies.

Due to the high upfront costs and extended payback periods of installing on-site solar generation, the City may also consider solar Power Purchase Agreements (PPA) with a solar developer. These contracts allow the City to benefit from an attractive \$/kWh rate with no upfront installation costs. For more information on implementing solar via PPA see **Appendix B**.



XI. Energy Management Policy

At present, the City does not have a City-wide energy management policy. By requesting this study, the City has demonstrated interest in taking a more aggressive approach to energy management. In order to establish an effective Energy Management Program, it should have support from top management. An Energy Management Policy adopted by the City Council sends a strong signal that energy management is an institutional priority.

At a minimum, the energy management plan should address the following:

- Who is accountable for energy management
- What your energy savings targets are
- How you will monitor, review and report on progress
- Staffing and training to support the policy
- Criteria for energy management investment
- Working energy efficiency into new capital investments

Energy Management Policy

On the following page, a sample Energy Management Policy is included for City's consideration. This short document can be used as an authoritative document supported by the City Council to develop City-specific energy management plan meeting overall objective as laid out in the energy policy.

Energy Management Plan

Following the Energy Management Policy are some suggestions that could also be considered for inclusion in the City's Energy Management Plan as it is developed for implementation. Ideally, the Energy Management Plan should be reviewed and updated periodically. The Energy Management Plan includes the following subsections:

- Mission Statement
- Statement of Concerns
- Commitment to Implementation of Program
- Promotion of Energy Management
- Energy Management Goals
- Acceptable Equipment Parameters
- Equipment Usage and Requirements
- Lighting Energy Conservation
- Maintenance and Operation (M&O) for Buildings and Equipment
- New Building and Construction
- Alternative Energy Sources
- Establish a Water Management Program



**RESOLUTION TO APPROVE AN ENERGY MANAGEMENT POLICY
CITY OF HILSHIRE VILLAGE
(SAMPLE)**

Whereas, recognizing that it is the best interests of the City of Hilshire Village to conserve energy and natural resources, and that energy efficient operations will reduce the City's energy consumption.

This policy serves as direction for the City’s staff to develop, implement and enforce City-wide Energy Management Plan and guidelines. The City should review and update the Energy Management Plan periodically in order to comply with energy related legislative mandates. The Energy Management Plan shall include, but not be limited to, the following:

- A. Establish and maintain utility tracking system for city-metered electricity, water, or natural gas consumption for which the City is responsible to pay and the aggregated costs of those utility services.
- B. Establish energy consumption baseline and individual campus benchmark (Energy consumption and cost per square feet) for comparisons and monitoring.
- C. Establish acceptable temperature setpoint ranges for cooling and heating to be implemented City-wide.
- D. Establish HVAC systems start/stop times and procedure for use of afterhours usage.
- E. Establishing a staff and facility incentive and recognition program would help promote and encourage support from staff.
- F. Conduct energy audits to ensure energy cost reduction measures are identified and prioritized.
- G. Identify resources and funding options to implement energy cost reduction measures through capital improvement facility retrofit projects.

Whereas, implementation of this Energy Management Policy shall be the joint responsibility of the City’s administrators, employees and support personnel;

Now, therefore, be it resolved by the City Council for the City of Hilshire Village that it hereby approves and adopts this Energy Management Policy, to be effective immediately.

Executed this XX day of XXXXX, 20XX

By: _____
Mayor, City of Hilshire Village

Attest: _____
City Secretary, City of Hilshire Village



ENERGY MANAGEMENT PLAN (SAMPLE)

Mission Statement

The City's Energy Management Plan, to be implemented City-wide, will produce a safe and productive environment for our staff, while simultaneously providing prudent management of our financial and energy resources.

Statement of Concerns

The City is concerned with current and projected energy costs, the availability and procurement of electrical energy resulting from the deregulation of the electrical industry and the power requirements facing the City due to current population growth patterns within the area. As a result, the development and implementation of a comprehensive, yet flexible, energy management plan is believed to be in the best interest of the City.

Commitment to Implementation of Program

Implementation of this Energy Management Plan (EMP) shall be the joint responsibility of the City administrators, staff, and support personnel. The success of the EMP is dependent upon total cooperation from every level within the system.

Promote Energy Awareness

The City shall establish a program to publicize the City's energy goals and progress on a quarterly or semiannually basis. Continuous promotion of the City's goals will ensure the sustainability of the energy management program and help achieve further energy savings.

Energy Management Goals

The City will develop a comprehensive program for energy efficient operation city-wide. The goal of this program shall be to maximize energy efficiency throughout the City with proper consideration given to environmental and safety issues. The City will then be responsible for the implementation, operation, and enforcement of the program. In addition, the City will:

1. Establish routine energy tracking and reporting procedures to monitor energy usage and cost. This will help to identify energy use patterns, as well as determine the effectiveness of the Energy Management Policy.
2. Evaluate energy rates and utility provider proposals to obtain the most reliable and cost-effective energy sources available to the City.
3. Routinely review efficiency improvements within pertinent industries and recommend new technologies, more efficient equipment, systems, and operating techniques.
4. The City will develop an atmosphere of cooperation and establish acceptable operating practices among their staff and within their departmental practices.
5. Annually review and revise these standard practices, as needed.
6. The City will develop and promote educational energy awareness programs, as needed.



Energy Purchase - The City will be responsible for negotiations and purchase of energy required for both current and projected future needs. Plans for the purchase and distribution (if necessary), of energy for existing and planned facilities will be coordinated with energy conservation in mind.

Systems/Equipment Purchase - Minimum efficiency levels of each major system and equipment type shall be established by the City. All new equipment purchased by the City must have an Energy Star rating.

Education - The City will be responsible for communicating policy, distributing educational information about measures implemented, and providing the consistent stream of communication needed to keep energy efficiency as one of the major concerns of the City.



Acceptable Equipment Parameters

The City has established a City-wide uniform temperature set point for all HVAC units. Having a standard setpoint will help keep HVAC runtimes to a minimum. The City will monitor and ensure that other building parameters (humidity levels, etc.) are within acceptable limits. Also, areas with special equipment (MDF/IDF, server rooms, etc.) or materials (wood flooring, paper storage, etc.) shall be maintained at the equipment supplier's recommended settings and settings appropriate to the material.

- **Occupied Cooling Temperature Setpoints: 73°F - 76°F**
- **Unoccupied Cooling Temperature Setpoints: 85°F**
- **Occupied Heating Temperature Setpoints: 67°F - 69°F**
- **Unoccupied Heating Temperature Setpoints: 55°F**

The start and stop times will be adjusted seasonally to avoid unnecessary run time. All HVAC systems will be shut off during holidays, unless activities are scheduled, or environmental conditions dictate otherwise.

Electronic Voting Machines Operation and Storage Climate Control

The City should consult electronic voting machine manufacturer to establish climate control guidelines for such devices. Once guidelines are adopted they need to be applied and all responsible for maintenance notified. It is common practice to see these machines stored in areas with constant HVAC operation. However, these machines are typically designed for higher operating and storage temperatures & humidity ranges. Below are typical climate control conditions for the devices, adjusting to ensure manufacturer required conditions are satisfied, that will yield in energy savings.

Operating temperature range: 50 – 90 degree F.
Storage temperature range: 32 – 120 degree F.
Humidity range: 30% to 80% non-condensing



Equipment Usage and Requirements

1. New equipment will be Energy Star compliant.
2. All vending machines will include Energy Miser systems.
3. All electrical powered equipment in offices will be turned off when not in use. Equipment includes but is not limited to computers, printers, monitors, desk lamps, and radios.
4. Ice makers will only be allowed in kitchens, clinics, and break rooms.
5. Lamps are to be discouraged but if used, the owner must furnish LED bulbs or Compact Fluorescent Lamps (CFLs).
6. The following equipment is NOT allowed in any City building, outside of approved areas, without the approval of the _____ or designee:
 - a. Space Heaters
 - b. Mini Refrigerators
 - c. Cooking equipment such as microwaves, toasters, coffee makers, refrigerators, etc.
 - i. These items are allowed in break rooms and clinics (for clinical use)

Lighting Energy Conservation

1. Lights in all areas shall be turned off while unoccupied.
2. Custodial staff shall turn off lights in any area in which they are not working.
3. Parking lot lights will be restricted to the following times: 8PM – 7AM.
4. Lighting will come on for 1 hour to assure the custodial staff exits safely.
5. Motion sensors should be used for room lighting where applicable and cost effective; added in new construction and during major renovations.
6. Lights will be removed from all vending machines
7. All lighting, except safety lighting, will be turned off when building alarm is set.

Maintenance and Operation (M&O) for Buildings and Equipment

Inventory all major Heating, Ventilation and Air Conditioning (HVAC) equipment and record location, capacity/size, manufacturer, model number, and electrical data. Establish a system for preventive maintenance of equipment. Inventory building equipment (lighting, HVAC, etc.) operating hours, and implement a program to turn off equipment during unoccupied periods and to reduce light levels as appropriate. Survey Building Envelope and record existing condition of all items that can leak air into or out of the building. The maintenance personnel should follow the surveyor and make corrections. Provide for training of M&O staff both in-house and through outside seminars to maintain skills and develop new skills as required.

New Building and Construction

Energy efficiency considerations should be integrated in the design phase for new construction projects, where return on investment over code-required minimums is most advantageous. Energy savings potential can also be maximized in this phase with better integration of building systems, infrastructure, and controls that comes with the “blank canvas” of a new design. Energy efficiency design alternatives should be considered including, but not limited to: LED indoor and outdoor lighting, dimmable daylighting and occupancy controls for interior lighting, premium efficiency cooling equipment, variable volume pumping



and air systems, separate treatment of outside air for ventilation with energy recovery, and high efficiency plumbing fixtures for additional water savings.

Alternative Energy Sources

Pursue cost effective applications of alternative energy sources including, but not limited to, PV Solar Arrays, Solar Water Reheat, and alternative fuels.

Establish a Water Management Program

The City should also establish a program to reduce water consumption. The following conservation measures should be employed:

1. Investigate the use of water conserving faucets and toilets in all new and existing facilities.
2. Utilize water-pervious materials such as gravel, crushed stone, open paving blocks or previous paving blocks for walkways and patios to minimize runoff and increase infiltration.
3. Employ Xeriscaping, using native plants that are well suited to the local climate, that are drought-tolerant and do not require supplemental irrigation.
4. Utilize drip irrigation systems for watering plants in beds and gardens.
5. Install controls to prevent irrigation when the soil is wet from rainfall.
6. Establish a routine check of water consuming equipment for leaks and repair equipment immediately.



XII. LoanSTAR Funding for Utility Cost Reduction Measures

Institutional organizations have traditionally tapped bond money, maintenance dollars, or federal grants to fund energy-efficient equipment change-outs or additions such as energy-efficient lighting systems, high efficiency air conditioning units, and computerized energy management control systems. The LoanSTAR (Saving Taxes and Resources) Program, which is administered by the State Energy Conservation Office, is an excellent alternative funding option for these projects.

LoanSTAR finances energy-efficient building retrofits at a low interest rate (typically 2 percent). The program’s revolving loan mechanism allows borrowers to repay loans through the stream of cost savings realized from the projects. Projects financed by LoanSTAR must have an average simple payback of fifteen years or less and must be analyzed in a Utility Assessment Report by a Professional Engineer. Upon final loan execution, the City proceeds to implement funded projects through the traditional bid/specification process.

NOTICE OF LOAN FUNDS AVAILABILITY (LoanSTAR Program Solicitation Details)

- Maximum loan size per application: \$8 million (amount may vary each year)
 - For loans funded with repaid ARRA funds, the minimum loan size is \$3 million.
- Maximum number of loans for this solicitation: three per applicant
- Loan interest rate: 2 percent annually (1 percent for ARRA funds)
- 15-year maximum loan term
- Borrower must own but need not occupy or operate facility
- HVAC saving degradation rate of 0.75% annually

Schedule

Applications will be reviewed on a first-come, first-served basis.

Description	Date
Issuance	Typically, October each year
Application Submission	Open enrollment through Aug. 31 (the following year)
Contract Execution	As soon thereafter as practicable. <i>(Note: Utility Assessment Report (UAR) technical review and approval by SECO is required for loan agreement execution between borrower & SECO. Documentation must comply with the LoanSTAR Technical Guidelines.)</i>

Applicants may either submit a Utility Assessment Report (“UAR”) or a Commissioning Report, as applicable, with the Loan Application, or submit a Project Assessment Commitment (“PAC”) or a Preliminary Energy Assessment (“PEA”) along with an executed Memorandum of Understanding (“MOU”).



Schools and Local Government Energy Management Program Preliminary Energy Assessment

The following chart illustrates the Technical Review process for Applicants, based on available funds that are not already committed (**Note these reviews are done by SECO at no cost to the borrower**):



Design-Bid-Build, Design-Build, ESPCs and Commissioning Projects

After a SECO Loan Agreement has been executed, Borrower can begin the process of designing and implementing the projects identified in the report. The following chart illustrates the Construction Review process for Applicants,



After submittal of the Final Completion Report to SECO and the final reimbursement request is made, the Borrower will request a Loan Repayment Schedule from SECO. The Loan Repayment Schedule will contain the outstanding loan balance, the term of the loan and the schedule of quarterly payments to SECO.

Should the City decide to pursue LoanSTAR funding for implementation of any of the project recommendations in this report, Appendix G may also assist in that regard. A sample LoanSTAR application from a recent NOLFA is provided with some tips on completing it using the information from this preliminary assessment. **Note that the example form provided is for reference only from a previous round of funding, and certain fields, requirements, and point criteria are subject to change.** The City is encouraged to use this general guide along with information from SECO on the specific NOLFA in question. Updated application materials and information for the latest NOLFA are posted on the SECO website as they are released at <http://www.seco.cpa.state.tx.us/funding/>. Orientation webinars are typically also provided by SECO at this address to review the process and field any NOLFA-specific questions.

For additional information regarding the LoanSTAR program see Appendix G and please contact:

John Kyere, CTCM, MA
SECO, Data Analysis & Transparency Division
John.Kyere@cpa.texas.gov
(512)-463-4867





XIII. Additional UCRM Funding Options

Alternative SECO Funding

Throughout the year, SECO announces various funding opportunities to support efficiency programs. Funding opportunities include Notice of Loan Fund Availability for the LoanSTAR program, Request for Applications for energy efficiency grants and Requests for Proposals for qualified firms to contract with SECO on projects. Please see the following link to stay up to date on SECO funded opportunities.

<https://comptroller.texas.gov/programs/seco/funding/>

Internal Financing

Improvements can be paid for by direct allocations of revenues from an organization's currently available operating or capital funds (bond programs). The use of internal financing normally requires the inclusion and approval of energy-efficiency projects within an organization's annual operating and capital budget-setting process. Often, small projects with high rate of return can be scheduled for implementation during the budget year for which they are approved. Large projects can be scheduled for implementation over the full time period during which the capital budget is in place. Budget constraints, competition among alternative investments, and the need for higher rates of return can significantly limit the number of internally financed energy-efficiency improvements.

Private Lending Institutions or Leasing Corporations

Banks, leasing corporations, and other private lenders have become increasingly interested in the energy efficiency market. The financing vehicle frequently used by these entities is a municipal lease. Structured like a simple loan, a municipal leasing agreement is usually a lease-purchase arrangement. Ownership of the financed equipment passes to the City at the beginning of the lease, and the lessor retains a security interest in the purchase until the loan is paid off. A typical lease covers the total cost of the equipment and may include installation costs. At the end of the contract period the lessee pays a nominal amount, usually a dollar, for title to the equipment.

Performance Contracting with an Energy Service Company

Through this arrangement, an energy service company (ESCO) uses third party financing to implement a comprehensive package of energy management retrofits for a facility. This turnkey service includes an initial assessment by the contractor to determine the energy-saving potential for a facility, design work for identified projects, purchase and installation of equipment, and overall project management. The ESCO guarantees that the cost savings generated by the projects will, at a minimum, cover the annual payment due to the ESCO over the term of the contract.

Utility Sponsored Energy Efficiency Incentive Programs

Many utilities in Texas offer energy efficiency incentive programs to offset a portion of the upfront cost associated with energy efficiency measures. The program requirements and incentives range from utility to utility. For example, CenterPoint Energy provides incentives for efficiency measures such as installation



of high efficiency equipment, lighting upgrades, and building commissioning. These energy efficiency programs' incentives typically cover \$0.06/kWh and \$175/kW of verifiable energy and demand reductions, respectively. For further information, contact your utility provider to determine what programs are available in your area.

Energy Efficiency and Conservation Block Grant (EECBG)

The Office of Weatherization and Intergovernmental Programs (WIP) has administered the EECBG, which provides funding to state and local governments for the purpose of improving energy usage and efficiency, as well as improving environmental effects. It is being funded under the ARRA, and can include building retrofits and audits, which aim to reduce energy use in buildings and transportation. The State Energy Conservation Office receives a portion of these funds to distribute to cities and counties interested in these projects. Further information can be found by visiting:

<http://www1.eere.energy.gov/wip/eecbg.html>

Qualified Energy Conservation Bonds (QECB)

Energy projects can be eligible for QECBs, which are tax credit bonds that serve to assist with energy efficient capital projects, renewable energy usage, and reductions in energy consumption. The federal government has issued this loan program, which assists with funding of the interest costs for the bonds. These energy conservation bonds are different from tax-exempt bonds traditionally used because they can be regarded as taxable income. For more information on QECBs, please visit <http://www.dsireusa.org>

APPENDICES

APPENDIX A

ENERGY LEGISLATION (SB898, SB924, AND SB300)

*Please note this Appendix is provided for historical reference only

How to comply with SB898 & SB924

What you need to know about Texas Senate Bill 898

The passage of Senate Bill 898 (SB898) by the 82nd Texas Legislature signified the continuance of Senate Bill 5 (SB5) and SB12, the Texas Legislature's sweeping approach since 2001 to clean air and encourage energy efficiency in Texas. SB898 was enacted on September 1, 2012 and was crafted to continue to assist the state and its political jurisdictions to conform to the standards set forth in the Federal Clean Air Act. The bill contains energy-efficiency strategies intended to decrease energy consumption while improving air quality.

All political subdivisions, institutes of higher education, and state agencies in the 41 non-attainment or near non-attainment counties in Texas are required to:

- 1) *Adopt a goal to reduce electric consumption by 5 percent each year for ten years, beginning September 1, 2011.*
- 2) *Implement all cost-effective energy-efficiency measures to reduce electric consumption by existing facilities. (Cost effectiveness is interpreted by this legislation to provide a 20 year return on investment.)*
- 3) *Report annually to the State Energy Conservation Office (SECO) on the entity's progress, efforts and consumption data.*
- 4) *See following pages of this appendix for previous year sample report and bill analysis.*

What you need to know about Texas Senate Bill 924

The passage of Senate Bill 924 by the 82nd Texas Legislature signified the continuance of House Bill 3693 (HB3693), intended to provide additional provisions for energy-efficiency in Texas. HB 3693 is an additional mechanism by which the state encourages energy-efficiency for School Districts, State Entities, and Political Jurisdictions in Texas. HB 3693 includes the following state-wide mandates that apply differently according to the nature and origin of the entity:

Record, Report and Display Consumption Data

All Political Subdivisions, State Agencies, and State-Funded Institutes of Higher Education, are mandated to record and report the entity's metered resource consumption usage data for electricity, natural gas and water on a publically accessible internet page.

Note: *The format, content and display of this information are determined by the entity or subdivision providing this information.*

Energy Efficient Light Bulbs

All School Districts and State-Funded Institutes of Higher Education shall purchase and use energy-efficient light bulbs in education and housing facilities.

Additional SB924 Mandates

In addition to the mandates of HB3693 noted above, SB924 requires municipally owned utilities and electric cooperatives to report annually to SECO on energy efficiency goals and initiatives. See the following pages of this appendix for sample reporting form.

What you need to know about Texas Senate Bill 300

In 2009, the Texas 81st Legislative Session passed Senate Bill 300 amending the Education Code §311.1513 to require schools to develop a long-range energy plan.

SB300 Mandates

Texas school districts must establish a long-range energy plan to reduce the district's annual electric consumption by five percent beginning with the 2008 state fiscal year and consume electricity in subsequent fiscal years in accordance with the district's energy plan

The plan shall include strategies for achieving energy efficiency that result in net savings to the district; or that can be achieved without financial cost to the district, and the initial short-term capital cost and lifetime cost and savings that may result from implementation of the strategy.

SB300 Reporting

Districts may submit their long-range energy plans to SECO for the purposes of determining whether funds available through loan programs administered by SECO are available to the district. However, plans and reports are not required to be submitted at this time.

How do you define energy-efficiency measures?

Energy-efficiency measures are defined as any facility modifications or changes in operations that reduce energy consumption. Energy-efficiency is a strategy that has the potential to conserve resources, save money** and better the quality of our air. They provide immediate savings and add minimal costs to your project budget.

Examples of energy-efficiency measures include:

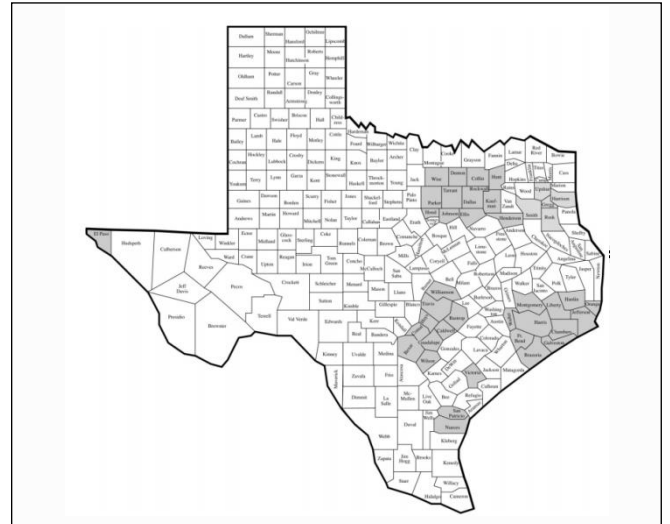
- installation of insulation and high-efficiency windows and doors
- modifications or replacement of HVAC systems, lighting fixtures and electrical systems
- installation of automatic energy control systems
- installation of energy recovery systems or renewable energy generation equipment
- building commissioning
- development of energy efficient procurement specifications
- employee awareness campaigns

****SECO's Preliminary Energy Assessment (PEA) program is an excellent resource for uncovering those energy-efficiency measures that can benefit your organization.**

What counties are affected?

All political jurisdictions located in the following Non-attainment and affected counties:

Bastrop Bexar Brazoria Caldwell Chambers Collin
Comal Dallas Denton El Paso Ellis Fort Bend
Galveston Gregg Guadalupe Hardin Harris Harrison
Hays Henderson Hood Hunt Jefferson Johnson
Kaufman Liberty Montgomery Nueces Orange Parker
Rockwall Rusk San Patricio Smith Tarrant Travis
Upshur Victoria Waller Williamson Wilson Wise



What assistance is available for affected areas?

The Texas Energy Partnership is a partner with ENERGY STAR®, who partners across the nation with the goal of improving building performance, reducing air emissions through reduced energy demand, and enhancing the quality of life through energy-efficiency and renewable energy technologies.

To assist jurisdictions, the Texas Energy Partnership will:

- Present workshops and training seminars in partnership with private industry on a range of topics that include energy services, financing, building technologies and energy performance rating and benchmarking
- Prepare information packages – containing flyers, documents and national lab reports about energy services, management tools and national, state and industry resources that will help communities throughout the region
- Launch an electronic newsletter to provide continuous updates and develop additional information packages as needed

Please contact Margaret Garcia at (512) 463-1947 for more information.

SECO Program Contact Information

**LoanSTAR;
Preliminary Energy Assessments:**
John Kyere, CTCM, MA
(512)-463-4867
John.Kyere@cpa.texas.gov

Schools & Local Govt. Partnership Program:
Margaret Garcia – 512-463-1947
Margaret.Garcia@cpa.state.tx.us

Engineering (Codes / Standards):
Fred Yebra, P.E.- 512-475-0753
Fred.Yebra@cpa.texas.gov

Alternate Fuels / Transportation:
Margaret Garcia – 512-463-1947
Margaret.Garcia@cpa.state.tx.us

Innovative / Renewable Energy:
Margaret Garcia - 512-463-1947
Margaret.Garcia@cpa.state.tx.us

**Energy / Housing
Partnership Programs:**
Margaret Garcia - 512-463-1947
Margaret.Garcia@cpa.state.tx.us

Cool Schools Program
John Kyere, CTCM, MA
(512)-463-4867
John.Kyere@cpa.texas.gov

Margaret Garcia - 512-463-1947
Margaret.Garcia@cpa.state.tx.us

BILL ANALYSIS

Senate Research Center

S.B. 898
By: Carona
Business & Commerce
8/3/2011
Enrolled

AUTHOR'S / SPONSOR'S STATEMENT OF INTENT

The statutory requirement for certain state and political subdivisions in air quality non-attainment areas to report energy efficiency goals will expire in 2012. Energy efficiency reporting is beneficial for verification and more accurate load forecasting. Consequently, S.B. 898 requires that the 41 municipalities and counties in non-attainment areas continue to report their energy efficiency goal process through 2020, as well as standardizes this reporting to the State Energy Conservation Office (SECO).

To reduce electricity consumption, Chapter 388 (Texas Building Energy Performance Standards), Health and Safety Code, currently mandates that each political subdivision, institution of higher education, or state agency, must implement all energy efficiency measures that meet energy conservation standards established under Section 302.004(b) (relating to requiring an energy savings performance contract to contain provisions requiring the provider of the energy or water conservation or usage measures to provide a guarantee), Local Government Code. Furthermore, each entity must establish a goal to reduce electric consumption by five percent; but this goal expires in 2012. Lastly, each entity must submit annual reports to SECO documenting efforts and progress towards energy efficiency. SECO reports the effectiveness of these energy efficiency programs to the Texas Commission on Environmental Quality (TCEQ) for inclusion in the state's air quality plans.

S.B. 898 extends the five percent goal progress reporting requirement of 2020. To provide consistent reporting on energy efficiency efforts, the bill eliminates a reporting exemption should entities not meet the goal. In addition, SECO is required to evaluate the effectiveness of these programs, and using that evaluation and program data, the Energy System Laboratory (ESL) must calculate energy savings and pollution reduction estimates. The calculations ESL produces will be shared with the Electricity Reliability Council of Texas, the Environmental Protection Agency, and TCEQ to facilitate long-term forecasting.

S.B. 898 amends current law relating to energy efficiency programs in institution of higher education and certain governmental entities.

[**Note:** While the statutory reference in this bill is to the Texas Natural Resource Conservation Commission (TNRCC), the following amendments affect the Texas Commission on Environmental Quality, as the successor agency to TNRCC.]

RULEMAKING AUTHORITY

This bill does not expressly grant any additional rulemaking authority to a state officer, institution, or agency.

SECTION BY SECTION ANALYSIS

SECTION 1. Amends Sections 388.005(c), (d), and (e), Health and Safety Code, as follows:

(c) Requires each political subdivision, institution of higher education, or state agency to establish a goal to reduce the electric consumption by the entity by at least five percent, rather than by five percent, each state fiscal year for 10, rather than six, years, beginning September 1, 2011, rather than 2007.

(d) Requires a political subdivision, institution of higher education, or state agency that does not attain the goals established under Subsection (c) to include in the report required by Subsection (e) justification that the entity has already implemented all available cost-effective measures. Provides that an entity that submits a report under this subsection indicating that the entity has reviewed its available options, has determined that no additional measures are cost-effective, and has already implemented all available cost-effective measures is exempt from the annual reporting requirement of Subsection (e) if a subsequent report would indicate no change in status.

(e) Requires a political subdivision, institution of higher education, or state agency annually to report to State Energy Conservation Office (SECO), on forms provided by that office, regarding the entity's goal, the entity's efforts to meet the goal, and progress the entity has made under this section. Requires SECO to provide assistance and information to the entity to help the entity meet goals established under this section. Requires SECO to develop and make available a standardized form for reporting purposes. Makes nonsubstantive changes.

SECTION 2. Amends Section 388.006, Health and Safety Code, as follows:

Sec. 388.006. STATE ENERGY CONSERVATION OFFICE EVALUATION. Requires SECO annually to provide the Texas Natural Resource Conservation Commission (TNRCC) and the Energy Systems Laboratory at the Texas Engineering Experiment Station of The Texas A&M University System (laboratory) with an evaluation of the effectiveness of state and political subdivision energy efficiency programs, including programs under this chapter. Requires the laboratory to calculate, based on the evaluation and the forms submitted to SECO, the amount of energy savings and estimated reduction in pollution achieved as a result of the implementation of programs. Requires the laboratory to share the information with TNRCC, the United States Environmental Protection Agency, and the Electric Reliability Council of Texas to help with long-term forecasting in estimating pollution reduction.

SECTION 3. Effective date: September 1, 2011.

**Senate Bill 898 (82R) Reporting Form
State Fiscal Year 2014 / Year 3 Reporting
Reports due: November 1, 2014**



Purpose of this Document: In 2011, the Texas Legislature passed Senate Bill 898 amending the Health and Safety Code §388.005 to require each political subdivision, institution of higher education, or state agency to establish a goal to reduce electrical consumption by at least five percent each fiscal year for ten years beginning September 1, 2011. Each entity must report to the State Energy Conservation Office (SECO) regarding the entity's efforts to meet the goal, and progress the entity has made.

Note: Current and previous SB898 report forms can accessed online at <http://www.seco.cpa.state.tx.us/energy-reporting/non-attainment.php>

Entity Name

Public Entity Type (check one): Municipality County State Agency Higher Education Other (please list type): _____

Street Address City Zip Code

County

Contact Name Title

Email Address Phone Number

Reduction Goal

As mandated by Senate Bill 898 (82R), has your entity established a goal to reduce electrical consumption by at least five percent each year through August 31, 2021? Yes No

Areas of Improvement

Please check the appropriate boxes below indicating the areas in which your entity has made efforts and progress toward meeting energy goals.

- | | | |
|---|---|---|
| <input type="checkbox"/> Building Envelope | <input type="checkbox"/> Appliances/Equipment/Electronics | <input type="checkbox"/> Policy/Plan/Program |
| <input type="checkbox"/> Cogeneration/Combined Heat and Power | <input type="checkbox"/> HVAC | <input type="checkbox"/> Renewable Generation |
| <input type="checkbox"/> Sensors/Controls | <input type="checkbox"/> Insulation/ Radiant Barrier | <input type="checkbox"/> Water/Wastewater |
| <input type="checkbox"/> Cool Roof | <input type="checkbox"/> Lighting | <input type="checkbox"/> Water Conservation |
| <input type="checkbox"/> Education/Training | <input type="checkbox"/> Maintenance/Operation | <input type="checkbox"/> Water Heating |
| <input type="checkbox"/> Measurement/Verification | <input type="checkbox"/> Other: _____ | |

Describe Progress

Provide a brief narrative regarding the progress and efforts indicated above to reduce electrical consumption and a brief description of planned or applied reduction activities. Your description will be included in SECO's annual report. Please attach additional pages if needed.

Check here if additional documentation is attached.

For more information on Senate Bill 898 visit: <http://seco.cpa.state.tx.us/energy-reporting/non-attainment.php>

Electricity Consumption Data

Enter annual electrical usage in kWh for the State Fiscal Year 2014 (Year 3: 9/1/13 - 8/31/14) and gross baseline square footage of each building. Reporting total energy consumption is mandatory. A breakdown of energy consumption by building or infrastructure is optional.

Building / Infrastructure Type	Annual Consumption (kWh) (9/1/2013 - 8/31/2014)	Gross Baseline Square Footage (as of 9/1/2011)
Buildings		
Traffic Lights		
Street Lights		
Other: _____		
Other: _____		
Other: _____		
Totals: 0	kWh 0	Sq Ft

Water Infrastructure	Capacity (MGD)	Year 3 Avg. MGD (9/1/13 - 8/31/14)	Year 3 Water-Related Consumption (kWh)	Year 3 Consumption Total
Water / Wastewater Facilities	_____ MGD	_____ MGD	0 kWh	0 kWh

Exemption Request

In accordance with Senate Bill 898, a political subdivision, institution of higher education, or state agency that does not attain this goal must include justification that the entity has already implemented all available cost-effective measures. An entity that submits a report indicating that it has reviewed its available options, has determined that no additional measures are cost-effective, and that it has already implemented all available cost-effective measures is exempt from the annual reporting requirement if a subsequent report would indicate no change in status.

If requesting an exemption to the mandates of SB 898 please check the boxes and provide additional documentation to serve as justification for this exemption request.

- The Entity listed above has reviewed its available options, has determined that no additional measures are cost-effective, and that it has already implemented all available cost-effective measures.
- The Entity has included a report to this effect.

I have read Senate Bill 898 (82R) regarding exemptions, and hereby certify that the said entity has met the exemption.

Signature

Date

Submit this form automatically by pressing the "Submit Form" button on the top right corner of this page (if present), or by saving a copy of the completed form on your computer, and then emailing a digital copy the completed report to: **SB898.Reporting@cpa.state.tx**

Reporting may also be submitted by sending a hard copy or fax to:
State Energy Conservation Office
Attn: SB898 Report
111 E. 17th Street
Austin, Texas 78711-1440
Fax: 512-475-2569

This Area for SECO Use Only
 Received: _____
 Entity ID: _____
 PDF Saved: _____
 Entered in DB: _____

For more information on Senate Bill 898 visit: <http://seco.cpa.state.tx.us/energy-reporting/non-attainment.php>

Revised (10/14)

APPENDIX B

IMPLEMENTING SOLAR VIA PPA



Implementing Solar via PPA

The most cost-effective way to implement the solar projects is through a power purchase agreement (PPA) with a solar developer, or an equivalent agreement with the local regulated municipal or cooperative utility. The reason for significant savings is because of the tax credits available to the solar developer which non-taxable entities (like schools and municipalities) are not able to capture.

As an example, a public entity may sign a PPA or equivalent contract to purchase electricity from a solar developer for 6 cents/kWh for 25 years. The electricity produced from the solar installation effectively reduces 4CP transmission charges, which can make the effective rate paid in the 3–4 cent range. With a PPA or equivalent contract, there is no upfront cost to installing solar. The solar developer pays for installation of the solar system and owns the system and is responsible for all maintenance.

It is recommended to go through an RFP process to solicit competitive PPA or equivalent contract bids. Through the Texas SmartBuy Contract 961-M2 for electricity consulting and procurement services, SECO now sponsors an on-site solar procurement service. Contact the provider, Texas Energy Aggregation (mike.bendewald@texasenergyabc.com, 254-242-4246) or go to the SECO webpage for electricity procurement services to learn more (<https://comptroller.texas.gov/programs/seco/resources/tea/>).

APPENDIX C

BASE YEAR CONSUMPTION HISTORY

Facility Name	Approx. ft ²	Electric kWh/Yr	Electric kWh/ft ² /Yr	Electric \$Cost/Yr	Heat'g Fuel MMBTU/Yr	Heat'g Fuel kBtu/ft ² /Yr	Heat'g Fuel \$Cost/Yr	Total MMBTU/Yr	Total \$Cost/Yr	EUI kBtu/ft ² /Yr	ECI \$/ft ² /Yr
City Hall	2,200	10,265	4.7	\$878	27	12.2	\$398	62	\$1,276	28.1	\$0.58
TOTAL	2,200 ft ²	10,265 kWh/Yr	4.7 kWh/ft ² /Yr	\$878 Electricity	27 MMBTU/Yr	12.2 kBtu/ft ² /Yr	\$398 Heating Fuel	62 MMBTU/Yr	\$1,276 Energy	28.1 kBtu/ft ² /Yr	\$0.58 per ft ² /Yr

1) All heating fuel consumption converted to MMBTU heat input using factors 1 MCF = 1.03 MMBTU for natural gas.

Entity The City of Hillshire Village

FACILITY: City Hall

FLOOR AREA (SF) 2,200 estimated

MONTH		YEAR		ELECTRICAL			NATURAL GAS / FUEL		
				CONSUMPTION	DEMAND		TOTAL ALL	NG	TOTAL
					METERED	CHARGED	COST OF	CONSUMPTION	
		KWH*	KW	KW	DEMAND (\$)	ELECTRIC	MCF	COSTS (\$)	
March	2020	641	4	4	\$30	\$58	1.2	\$26	
April	2020	593	4	4	\$37	\$64	0.5	\$23	
May	2020	853	4	4	\$38	\$75	0.5	\$22	
June	2020	1,004	5	5	\$44	\$87	0.5	\$24	
July	2020	1,174	5	5	\$44	\$95	0.5	\$24	
August	2020	1,174	9	9	\$55	\$106	0.6	\$24	
September	2020	1,173	8	8	\$66	\$117	0.5	\$24	
October	2020	818	0	0	\$26	\$61	0.5	\$24	
November	2020	746	0	0	\$24	\$56	0.8	\$25	
December	2020	694	0	0	\$23	\$53	3.4	\$40	
January	2021	708	0	0	\$23	\$54	4.8	\$48	
February	2021	688	0	0	\$23	\$53	12.3	\$94	
TOTAL		10,265	40	40	\$434	\$878	26.1	\$398	

*Note March 2020 utility data was estimated as actual utility data was not readily available.

Annual Total Energy Cost = 1,276 \$/year

Total KWH/yr x 0.003413 = 35.03 MMBTU/year

Total MCF/yr x 1.03 = 26.88 MMBTU/year

Total Other x _____ = 0.0 MMBTU/year

Total Site MMBTU's/yr = 62 MMBTU/year

Energy Use Index:
Total site BTUs/Yr ÷ SF = 28 kBTU/SF/year

Energy Cost Index:
Energy Cost/Yr ÷ SF = 0.58 \$/SF/year

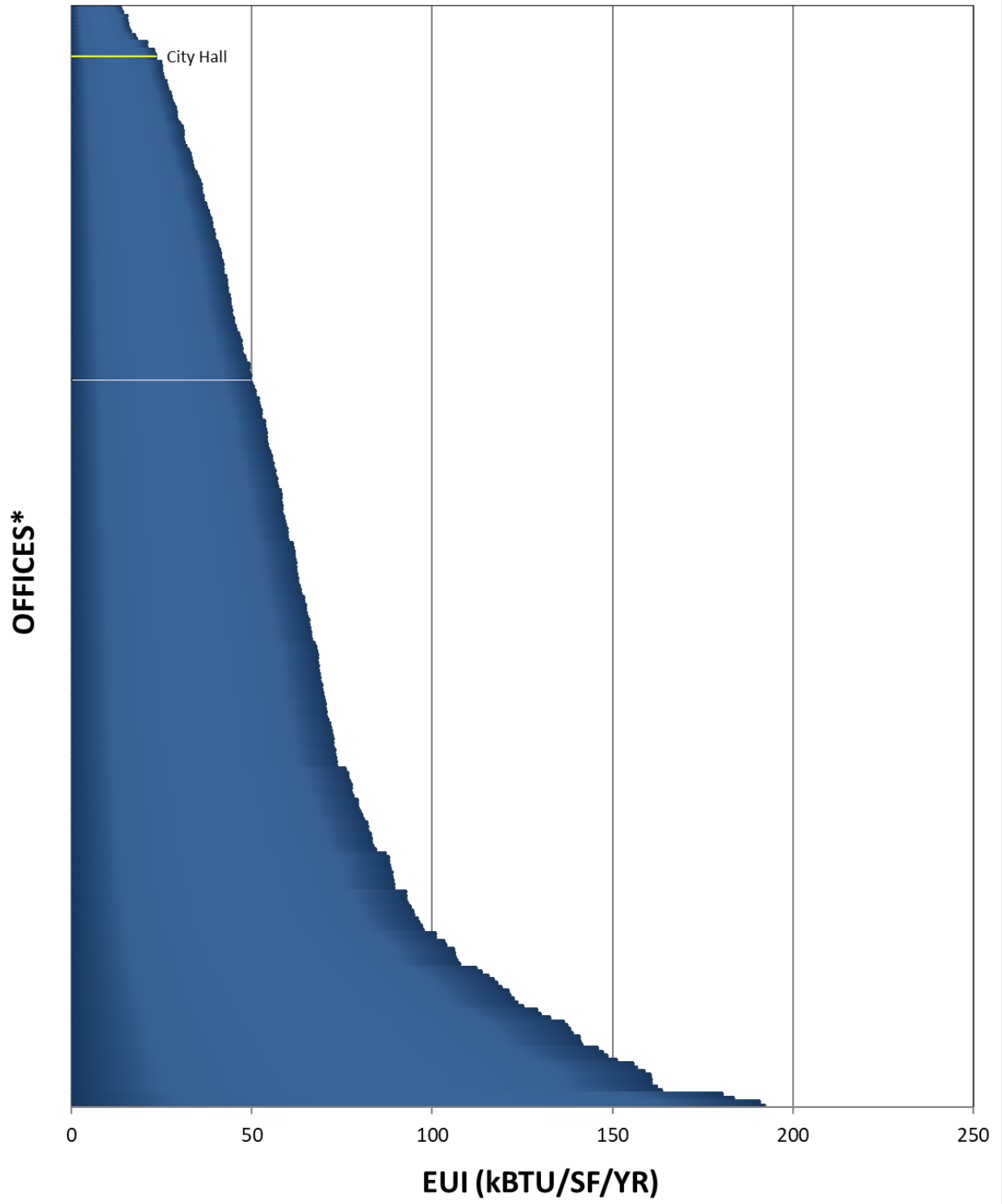
Electric Utility: Hudson Energy

Gas Utility: CenterPoint Energy

APPENDIX D

ENERGY PERFORMANCE COMPARISON CHARTS

**TEESI DATABASE OF LOCAL GOVERNMENT FACILITIES IN TEXAS
EUI COMPARISON CHART
FACILITY TYPE: OFFICES**



(The chart above is a comparison of EUIs based on sample data from TEESI's database of Texas Local Governments)

APPENDIX E

SIGNED SECO SERVICE REQUEST FORM

Preliminary Energy Assessment Service Request Form

Form# 50-852



City of Hilshire Village		713 973 1779	
<i>Public Entity Name</i>		<i>Telephone</i>	
Susan Blevins		713 252 7652	
<i>Contact Person</i>		<i>Title</i>	
susan.blevins@hilshirevillagetexas.com		City Administrator	
<i>Email Address</i>		<i>County</i>	
8301 Westview	Houston	Texas	77055
<i>Street Address</i>	<i>City</i>	<i>State</i>	<i>ZIP Code</i>
same			
<i>Mailing Address</i>	<i>City</i>	<i>State</i>	<i>ZIP Code</i>

Preliminary Energy Assessment Service Eligibility

The State Energy Conservation Office (SECO) provides free preliminary energy assessments (PEAs) for existing public facilities and infrastructure. Eligible entities include municipal and county governments, public school districts, county hospitals, port authorities, major airports, public water authorities and municipally owned utilities. Leased or rented facilities and infrastructure are not eligible for this service.

Principles of Agreement

By submitting this request form, the entity listed above must agree to:

- select a contact person to work with SECO and its designated contractor to establish an energy policy and set realistic energy efficiency goals;
- allow SECO's designated contractor to provide walk-through assessments of selected facilities;
- schedule a time for SECO's designated contractor to make a presentation on the assessment findings to key decision-makers;
- consider implementing the PEA's energy savings recommendations; and
- allow SECO to post portions of this report on its website

Additional Questions

Has this organization used SECO's technical assistance or PEA services in the past?

Yes No

Is the primary contact for this PEA familiar with SECO's LoanSTAR revolving loan program?

Yes No

Has this organization used SECO's LoanSTAR revolving loan program in the past?

Yes No

Signature

This agreement must be signed by your organization's chief executive officer or other signing authority.

Russell Herron

Signature

3-18-21

Date

Russell Herron.

Print Name

MAYOR

Title

Submit completed forms to SECO at Margaret.Garcia@cpa.texas.gov

or by mail to: State Energy Conservation Office

Attn: Margaret Garcia
111 E. 17th Street
Austin, TX 78711-1440

Margaret Garcia 03/19/21

APPENDIX F

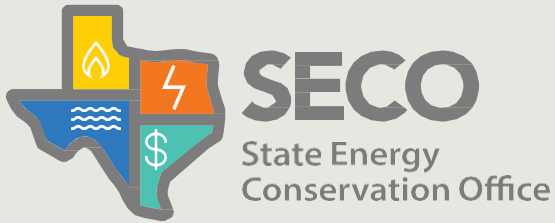
TYPICAL EQUIPMENT MAINTENANCE CHECKLISTS

Fans Checklist

Description	Comments	Maintenance Frequency			
		Daily	Weekly	Monthly	Annually
System use/sequencing	Turn off/sequence unnecessary equipment	X			
Overall visual inspection	Complete overall visual inspection to be sure all equipment is operating and safety systems are in place	X			
Observe belts	Verify proper belt tension and alignment			X	
Inspect pulley wheels	Clean and lubricate where required			X	
Inspect dampers	Confirm proper and complete closure control; outside air dampers should be airtight when closed			X	
Observe actuator/linkage control	Verify operation, clean, lubricate, adjust as needed			X	
Check fan blades	Validate proper rotation and clean when necessary			X	
Filters	Check for gaps, replace when dirty - monthly			X	
Check for air quality anomalies	Inspect for moisture/growth on walls, ceilings, carpets, and in/outside of ductwork. Check for musty smells and listen to complaints.			X	
Check wiring	Verify all electrical connections are tight				X
Inspect ductwork	Check and refasten loose connections, repair all leaks				X
Coils	Confirm that filters have kept clean, clean as necessary				X
Insulation	Inspect, repair, replace all compromised duct insulation				X

APPENDIX G

LOANSTAR INFORMATION



LoanSTAR Revolving Loan Program

Application Information Packet

RFA# BE-G22-2020

Overview

Program Summary

The Texas Comptroller of Public Accounts (“Comptroller”) administers the LoanSTAR (Saving Taxes and Resources) Revolving Loan Program through its State Energy Conservation Office (“SECO”). The program finances energy-related cost-reduction retrofits

for eligible public sector institutions, as set forth in this RFA. Low interest rate loans are provided to assist those institutions in financing their energy-related cost reduction efforts. The program’s revolving loan mechanism allows a Successful Applicant (hereinafter also referred to as a “Borrower”) to repay loans through the stream of energy cost savings realized from the projects.

This Request for Applications (“RFA”) allows applications to be submitted from the time of issuance until August 31, 2021. Loan- STAR Applications (“Applications”) received will be reviewed on a first-come, first-serve basis during the open enrollment period.

Solicitation Details

- Maximum individual loan amount: **\$8.0 million per Application**
- Maximum number of loans awarded for this solicitation: **3 per Applicant**
- Interest rate:
 - » 2% (no minimum loan size)
 - » 1% for American Recovery and Reinvestment Act (“ARRA”) funds. Minimum loan size \$3.0 million

Eligibility

Applicants must meet eligibility requirements before submitting an Application in response to this RFA.

Organization Eligibility

Eligible public sector institutions include any of the following: (1) a state agency, commission, board, office, institution, facility, or other state entity; (2) public junior college or community college; (3) an institution of higher education as defined in Section 61.3 of the Texas Education Code; (4) a unit of local government including a county, city, town, a public or non-profit hospital or health care facility; (5) a public school district (excluding charter schools); or (6) a political subdivision of the State of Texas. The public institution must own the facility where the proposed retrofit project will occur. The public institution need not occupy or operate the facility.

Project Eligibility

Projects funded under the LoanSTAR Revolving Loan Program Request for Applications may be implemented using Design-Build, Design-Bid-Build, Energy Savings Performance Contracts (“ESPCs”) or Commissioning approaches. Each Utility Cost Reduction Measure (“UCRM”) must have a simple payback that does not exceed the estimated useful life of the UCRM.

Projects must have a composite simple payback of fifteen (15) years or less.

Utility dollar savings are the number one criterion for determining if the measure can be considered an eligible UCRM. UCRMs are not limited to activities that save units of energy. A UCRM could conceivably call for actions which save no energy or consume additional BTUs, but save utility budget dollars. Examples of such UCRMs include demand reduction, increased power factor, load shifting, switching utility rate structures, and thermal storage projects. All improvements must meet minimum efficiency standards as prescribed by applicable building energy codes.

Examples of acceptable projects include:

- Building and mechanical system commissioning and optimization;
- Energy management systems and equipment control automation;
- High-efficiency heating, ventilation and air conditioning systems, boilers, heat pumps and other heating and air conditioning projects;
- High-efficiency lighting fixtures and lamps;
- Building shell improvements (insulation, adding reflective window film, radiant barrier, cool roof);
- Load management projects;
- Energy recovery systems;
- Low-flow plumbing fixtures, high efficiency pumps; or
- Retro- and re-commissioning.

Renewable energy efficiency projects are strongly encouraged wherever feasible and include:

- Installation of distributed technology such as rooftop solar water and space heating systems;
- Geothermal heat pumps (only closed loop systems with maximum 10-ton capacity);
- Electric generation with photovoltaic; or
- Small wind and solar-thermal systems.

Borrowers are responsible for compliance with all applicable state and federal laws, rules, and requirements, including United States Department of Energy (“DOE”) National Environmental Policy Act review and State Historical Preservation Office review, if applicable. Refer to the requirements set forth in the sample loan agreement.

Application Process

Schedule

Description	Date
Issuance of RFA	October 16, 2020 - 10 a.m. CT
Application Deadline	August 31, 2021 - 2 p.m. CT
Loan Approval and Award	As soon thereafter as practical and/or when funding becomes available. Applications that do not have MOU commitments by September 30, 2019 will expire.

Application Submission

All Applicants must submit one (1) electronic copy of the Application and Required Documentation uploaded through the SECO portal. Applications must be complete, signed by an authorized representative of Applicant and meet all the requirements of the LoanSTAR Program.

Applications may be submitted anytime during the open enrollment period. The deadline for submission during this enrollment period is 2:00 p.m. CT, on Friday, August 31, 2021.

Applications may NOT be submitted by fax or email. Faxed or emailed Applications will NOT be considered.

Late Applications will not be considered under any circumstance. Applicant shall be solely responsible for verifying Comptroller's timely receipt of a loan application.

Following the award of a loan, responses to this LoanSTAR Revolving Loan Program are subject to release as public information under the Texas Public Information Act.

Comptroller reserves authority, in its sole discretion, to provide the loans or to make multiple loans under this RFA, and/or to withdraw this RFA and cancel the RFA and the LoanSTAR Revolving Loan Program at any time. Comptroller and SECO shall have no liability whatsoever for any costs or expenses incurred in submission of Applications in response to this RFA.

Required Documentation

Applicants are required to submit an Application with supporting documentation:

Option 1 (Design-Bid-Build projects, Design-Build projects or ESPCs):

1. Loan Application;and
2. Utility Assessment Report.

Option 2 (Retro- or Re-commissioning projects):

1. Loan Application;and
2. Commissioning Report.

Option 3 (without Utility Assessment Report or Commissioning Report):

1. Loan Application;and
2. Project Assessment Commitment or Preliminary Energy Assessment; and
3. Memorandum of Understanding.

Applicants may either submit a Utility Assessment Report ("UAR") or a Commissioning Report, as applicable, with the Loan Application, or submit a Project Assessment Commitment ("PAC") or a Preliminary Energy Assessment ("PEA") along with an executed Memorandum of Understanding ("MOU"). Applicants who choose to submit a Loan Application with a PAC or PEA and MOU will be required to submit a UAR or a Commissioning Report within 140 days of execution of the MOU by SECO ("End Date for Commitment" in MOU). Loan Applications submitted with completed UARs or Commissioning Reports may be prioritized for evaluation, at SECO's discretion.

A UAR is required in order to receive funding for Design-Bid-Build projects and Design-Build projects. A Commissioning Report is required in order to receive funding for Retro- or Re-commissioning projects. The UAR and Commissioning Report Engineers are selected by Applicant and must be licensed in the state of Texas. Documentation must comply with the [LoanSTAR Technical Guidelines](#). There is not a prescribed format for Retro- or Re- commissioning project Commissioning Reports.

UARs and Commissioning Reports not having a Texas Licensed Professional Engineering seal will be evaluated the same as a PAC or PEA. All UAR and Commissioning Reports will be reviewed by a professional engineer selected by SECO.

Technical Review Process

The following chart illustrates the process for Applicants, based on available funds that are not already committed:



Construction Review Process

Design-Bid-Build, Design-Build, ESPCs and Commissioning Projects

After a SECO Loan Agreement has been executed, Borrower can begin the process of designing and implementing the projects identified in the report.



Loan Repayment

After submittal of the Final Completion Report to SECO and the final reimbursement request is made, the Borrower will request a Loan Repayment Schedule from SECO. The Loan Repayment Schedule will contain the outstanding loan balance, the term of the loan and the schedule of quarterly payments to SECO.

The outstanding loan balance on the Loan Repayment Schedule will include the aggregate amount disbursed to Borrower plus the interest accrued on the unpaid principal amount as calculated from the date of each disbursement to Borrower. Interest will continue to accrue until the outstanding loan balance has been repaid in full. The schedule of quarterly payments in the Loan Repayment Schedule will reflect the interest which is anticipated to accrue throughout the term of the loan based on timely payments.

The loan repayment term is equal to the Simple Payback as calculated in the UAR or Commissioning Report. Payments are due at the end of each fiscal quarter using the State of Texas fiscal year calendar.

SECO forwards the Loan Repayment Schedule to Borrower based on the incurred loan amount. Loan repayments will begin within sixty (60) days of SECO's acceptance of project completion.

Sample Loan Agreement

Applicants should carefully review the Sample Loan Agreement posted with this RFA. The Sample Loan Agreement represents a sample of the terms and conditions that will be executed between a Borrower and Comptroller and is incorporated by reference into this RFA. A final loan agreement must be fully executed by both Borrower and Comptroller before the commitment of loan funding will be provided. Each Applicant must review these terms and conditions in the Sample Loan Agreement and otherwise in this RFA and take any exceptions and otherwise address any concerns or identify any issues in writing with its Application. Terms and conditions not specifically objected to at the time of submittal will be deemed to be accepted by Borrower. Comptroller has final approval of any loan agreement awarded as a result of this RFA.

In addition to contact/administrative information on page 1, enter here the total loan amount requested from SECO. This amount includes all project implementation costs, plus escalation, M&V, detailed audit costs, etc. as allowed by the LoanSTAR guidelines, and less any buy down included from internal funds. It should not include financing costs or long-term M&V costs associated with energy savings performance contracts.

PART 1: General Information

Borrower

Name of Eligible Public Entity

Mailing Address

County Name

Total Amount Requested

Signing Authority

Name

Title

Telephone

Email Address

Primary Contact (Project Director)

Name

Title

Select from the listed application information types, described below. Note that all options eventually require a detailed investment grade audit before funds can be awarded. This section only indicates the information being submitted in the application phase.

Project (Energy Manager)

- **Utility Assessment Report** – If a detailed investment grade audit is developed prior to applying for LoanSTAR, If the project is to be delivered using an Energy Savings Performance Contract (ESPC), and an ESPC UAR has already been developed by the ESCO, select this option and submit the UAR with the application.
- **Commissioning Report** – If the loan being requested is intended to fund facilities commissioning, and a Cx report has already been developed, select this option and submit the Cx report with the application
- **Preliminary Energy Assessment** – Select this option if the detailed audit is to be performed after the application is selected, but the project scope and estimated cost have been identified in a PEA (such as this report). Submit PEA with application
- **Project Assessment Commitment** – Select this option if the detailed audit is to be performed after the application is selected, and a PEA has not been performed, or the proposed scope differs from that in the PEA

PART 2: Documentation Submitted with Application

Place a check next to the documentation submitted with the application. One (1) electronic copy of the report is required. Reports must comply with SECO guidelines. See attachments for Project Assessment Commitment and Memorandum of Understanding forms.

- Utility Assessment Report (UAR) – for design-bid-build projects, design-build projects or Energy Savings Performance Contracts (ESPCs)
- Commissioning Report – for Retro- or Re-Commissioning projects
- Preliminary Energy Assessment (PEA) and Memorandum of Understanding (MOU) – a UAR is required to be completed within 140 calendar days of execution of the MOU.
- Project Assessment Commitment and Memorandum of Understanding See attachments for Project Assessment Commitment and Memorandum of Understanding forms– a UAR is required to be completed within 140 calendar days of execution of the MOU.

If UAR cannot be completed within 140 calendar days after notice is received that funding is committed to the project, do not proceed. The project is disqualified from loan consideration.

**NOTE: Application requirements and format is subject to change.
Check SECO website for most recent NOLFA application.**

PART 3: Project Information

Complete the following table listing all Utility Cost Reduction Measures (UCRMs). Use Attachment A - Project Financial Worksheets to calculate energy savings.

Facility Name	<div style="border: 1px solid blue; padding: 5px;"> Enter facility name or District name if multiple buildings are to be included in the project. </div>			ZIP Code
Engineering Firm Name	<div style="border: 1px solid blue; padding: 5px;"> Enter the engineering firm who developed the EAR/UAR/CxR/PEA (N/A if submitting project assessment commitment) </div>			ZIP Code
Date of Audit Report				

UCRM NO.	BUILDING	UCRM DESCRIPTION
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

List the proposed UCRMs and affected facilities (i.e. "various campuses" if applying to multiple buildings). This information can be taken from Table 7 of this report if submitting a PEA with the application, or from various subsections of Section IX if submitting a Project Assessment Commitment using only select UCRMs.

How long will it take to complete the project? _____ (months)

A. Is the TOTAL LOAN simple payback for the UCRM less than 15 years?

If Yes, proceed to next question..

If No, project is disqualified from further loan consideration.

B. Is the simple payback for each UCRM less than the Estimated Useful Life of the UCRM?

If No, project is disqualified from further loan consideration.

Note that following SECO approval of the detailed audit and official award of the Loan, LoanSTAR requires construction to be completed typically within 12-18 months.

Yes No

NOTE: Application requirements and format is subject to change. Check SECO website for most recent NOLFA application.

PART 4: Funding Source

The LoanSTAR program has two funding sources. The interest rate for a LoanSTAR general fund loan is 2% per annum. The interest rate for a LoanSTAR repaid ARRA fund loan is 1% per annum, but requires additional reporting documentation.

What is your preferred funding source?

- 2% LoanSTAR general fund loan (no minimum loan size; maximum loan size is \$8,000,000)
- 1% LoanSTAR repaid ARRA fund loan (minimum loan size is \$3,000,000; maximum loan size is \$8,000,000)
- No preference
- Undecided

PART 5: Certification by Applicant Signing Authority or Chief Financial Officer

I certify that I have reviewed this application, including commitment of “buy-down” funds. The information provided is accurate to the best of my knowledge and in my best professional judgment. If awarded, Borrower will comply with the terms and conditions of the Sample Loan Agreement.

<input type="text"/>	<input type="text"/>
<i>Signature</i>	<i>Date</i>
<input type="text"/>	<input type="text"/>
<i>Printed Name</i>	<i>Title</i>

**NOTE: Application requirements and format is subject to change.
Check SECO website for most recent NOLFA application.**



Attachment A – Project Financial Calculation Worksheet (Required)

Attachment A1. Design-Bid-Build, Design-Build or Commissioning Project Calculation Worksheet

UCRM No.	Building	UCRM Description	Construction Time (Months)	Costs (\$)			Estimated Annual Saving (\$)*	Payback** (yrs)	UCRM Estimated Useful Life (yrs)
				Eng./Design	Construction	Total			
NOTE: Application requirements and format is subject to change. Check SECO website for most recent NOLFA application.									
<div style="border: 2px solid #004a99; padding: 10px; width: fit-content; margin: auto;"> <p>Use the information from Section IX and Table 7 of this report to complete this table. Composite payback (including EAR cost, metering cost, and monitoring cost included as desired by the Owner) must be less than 10 years, and individual measures must have paybacks less than the estimated useful life. The Owner may elect to “buy down” individual measures or the project as a whole from their own funds to meet these criteria. Buy down should be included where indicated in the project summary table.</p> </div>									
Totals									

* HVAC savings degradation = 0.75% each year.

** Individual energy efficiency measure payback must be less than or equal to the estimated useful life of the measure.

TOTAL LOAN AMOUNT

Costs for the UAR, metering and monitoring may be included in the loan at Borrower's option.

Costs (\$) Total		
plus UAR Costs		
plus Metering		(note: maximum metering cost is 3 percent of UCRM costs)
plus Monitoring		(note: maximum monitoring cost is 7 percent of UCRM costs)
minus Buy Down		
equals Total Loan Amount		
divided by Total Estimated Annual Savings (\$)		
equals Payback (years)		

Attachment A2. Energy Savings Performance Contract (ESPC) Project Calculation Worksheet

UCRM No.	UCRM Title	Average Annual Savings*							Project Cost (\$)	Payback** (yrs.)	Estimated Project Useful Life (yrs.)
		Electric Energy (kWh/yr)	Demand (kW/yr)	Electric (\$/yr)	Natural Gas (Mcf/yr)	Natural Gas (\$/yr)	Water (kGal/yr)	Water (\$/yr)			
1											
2											
3											
4											
5											
6											
7											
8											
Utility Assessment Report Cost		--	--	--	--	--	--	--		--	
Initial Measurement & Verification Cost		--	--	--	--	--	--	--		--	
Construction Bonding Cost		--	--	--	--	--	--	--		--	
Owner's Administration, Management, Training & Other Costs		--	--	--	--	--	--	--		--	
Buy Down***		--	--	--	--	--	--	--		--	
TOTAL LOAN AMOUNT (IMPLEMENTATION TOTAL) (Simple Payback)											
Required Ongoing Monitoring Service Cost		--	--	--	--	--	--	--		--	
Guaranteed Rebate Savings		--	--	--	--	--	--	--		--	
Financing Cost		--	--	--	--	--	--	--		--	
TOTAL PROJECT PAYBACK (Project Payback)		--	--	--	--	--	--	--		--	

* HVAC savings degradation = 0.75% each year.

** Individual energy efficiency measure payback must be less than or equal to the estimated useful life of the measure.

*** Maximum Buy Down on an individual UCRM must not exceed 50% of the total UCRM cost.

NOTE: Application requirements and format is subject to change. Check SECO website for most recent NOLFA application.



Attachment B- Project Assessment Commitment

Attachment B is not required when a Utility Assessment Report (UAR), Commissioning Report or Preliminary Energy Audit is submitted with the application.

Applicant requests LoanSTAR Funding be reserved for a proposed energy efficiency or commissioning project. The dollar amount requested is Applicant's estimated cost to analyze and implement energy efficiency projects that will be financed through the LoanSTAR Program.

LoanSTAR funds, if reserved, will be subject to the following conditions:

1. Applicant agrees to retain a Professional Engineer (PE), licensed in the State of Texas, to prepare a Commissioning Report or UAR that complies with the LoanSTAR Technical Guidelines or with Performance Contracting Guidelines. The PE shall meet the technical analyst qualifications listed in Volume I, Section I, Paragraph C of the LoanSTAR Technical Guidebook. The PE of record shall accept responsibility for implementation of all retrofit activities in the UAR.
2. Applicant agrees to complete a UAR for design-bid-build or design-build contracts or a Commissioning Report for commissioning projects within 140 days after the execution of the Memorandum of Understanding. Borrower also agrees to submit one (1) electronic copy of the completed Commissioning Report or UAR to the State Energy Conservation Office(SECO). **If the UAR is not received by SECO by the "End Date for Commitment", the reserved LoanSTAR funding will be released to other prospective borrowers.**
3. LoanSTAR project expenditures cannot be incurred before the effective date cited in a fully executed loan agreement. The sole function of a Project Assessment Commitment is to request reservation of LoanSTAR Funding for a Borrower during the period the Commissioning Report or UAR are being prepared. This document shall not be construed as a loan agreement and does not authorize the expenditure of LoanSTAR Funding.

Applicant

<div style="border: 1px solid #ccc; background-color: #e6f2ff; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px solid #ccc; background-color: #e6f2ff; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px solid #ccc; background-color: #e6f2ff; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px solid #ccc; background-color: #e6f2ff; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px solid #ccc; background-color: #e6f2ff; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px solid #ccc; background-color: #e6f2ff; height: 20px; margin-bottom: 5px;"></div>	\$	<div style="border: 1px solid #ccc; background-color: #e6f2ff; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px solid #ccc; background-color: #e6f2ff; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px solid #ccc; background-color: #e6f2ff; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px solid #ccc; background-color: #e6f2ff; height: 20px; margin-bottom: 5px;"></div>
Name of Public Entity		Amount Requested
Name of Signing Authority (printed)		Title
Signature		Date

NOTE: Application requirements and format is subject to change.
Check SECO website for most recent NOLFA application.



Attachment C- Memorandum of Understanding (MOU)

Attachment C is not required when a Utility Assessment Report (UAR) or Commissioning Report is submitted with the application.

Execution of this MOU reserves the requested amount of LoanSTAR Funding for the Applicant.

The reserved LoanSTAR Funding is Applicant's estimated cost based on the Preliminary Energy Assessment or Project Assessment Commitment to analyze and implement energy efficiency projects which will be financed through the LoanSTAR Program.

The LoanSTAR funds reserved will be subject to the following conditions:

1. Applicant's Signing Authority certifies that Applicant has retained a Professional Engineer (PE) to prepare a UAR. The PE of record shall accept responsibility for implementation of all retrofit activities in the UAR. The UAR shall be prepared in accordance with the LoanSTAR Technical Guidelines.
2. Applicant's Signing Authority certifies that one (1) electronic copy of the completed reports referenced in item 1 will be delivered to SECO for review. **If the completed reports are not submitted by the "End Date for Commitment", the reserved LoanSTAR Funding will be released to other prospective borrowers.**
3. The sole purpose of this MOU is to reserve LoanSTAR Funding for the Applicant during the period that its UAR is being prepared. This MOU shall not be construed as a loan agreement. It does not authorize the expenditure of LoanSTAR Funding. LoanSTAR project expenditures cannot be incurred before the effective date cited in a fully executed loan agreement.

Applicant

\$

Amount Requested

Name of Public Entity (printed)

Name of Signing Authority (printed)

Title

Signature

Date

State Energy Conservation Office
To be completed by SECO

SECO Program Manager Name (printed)

SECO Program Manager Signature

Date

End Date for Commitment (Commitments cannot be extended.)

NOTE: Application requirements and format is subject to change. Check SECO website for most recent NOLFA application.



APPENDIX H

ENERGY STAR PORTFOLIO MANAGER REFERENCE MATERIAL

INTRODUCTION TO ENERGY STAR PORTFOLIO MANAGER

An entity's energy baseline can be developed using ENERGY STAR's Portfolio Manager. One of the primary reasons for using ENERGY STAR Portfolio Manager is its ability to normalize the baseline according to several key factors (i.e. Weather, Square Feet, Hours of Operation, Number of Computers, etc.). It is also a free online resource available to all registered users, and is a user-friendly web-based tool.

ENERGY STAR is a joint program of the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE). ENERGY STAR has developed Portfolio Manager, an innovative online energy management tool, designed to help organizations track and assess energy and water consumption of their facilities. Portfolio Manager helps organizations set investment priorities, identify under-performing facilities, verify efficiency improvements, and receive EPA recognition for superior energy performance.

Portfolio Manager is also an energy performance benchmarking tool. Portfolio Manager rates a facility's energy performance on a scale of 1–100 relative to similar buildings and WWTPs nationwide. The rating system based on a statistically representative model utilizing a national survey conducted by the Department of Energy's Energy Information Administration. This national survey, known as the Commercial Building Energy Consumption Survey (CBECS), conducted every four years gathers data on building characteristics and energy use from thousands of buildings across the United States. A rating of 50 indicates that the facility, from an energy consumption standpoint, performs better than 50% of all similar facilities nationwide, while a rating of 75 indicates that the facility performs better than 75% of all similar facilities nationwide.

In addition, Portfolio Manager is used to generate a Statement of Energy Performance (SEP) for each facility, summarizing key energy information such as site and source energy intensity, greenhouse gas emission, energy reduction targets and energy cost. The Statement of Energy Performance is required for applying for ENERGY STAR Recognition from EPA/DOE. If ENERGY STAR recognition is pursued, the SEP will need to be verified and certified by a qualified professional.

Some facility types are not able to receive an ENERGY STAR rating. However, Portfolio Manager can still serve as a valuable tool for in tracking utility consumption and setting targets for performance of these facilities.

To develop an entity's baseline, 12 months of utility consumption, cost data, and Building Space Use information is required. The following is reference materials that explain how to input this information as well as perform other basic tasks within Portfolio Manager. For further information, please visit ENERGY STAR'S Portfolio Manager at:

http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager

LOGGING IN TO PORTFOLIO MANAGER

Log in to Portfolio Manager with user name and password. This will bring the user to the My Portfolio page, which includes a summary of the user's facilities.

Website: <https://portfoliomanager.energystar.gov/pm/login.html>

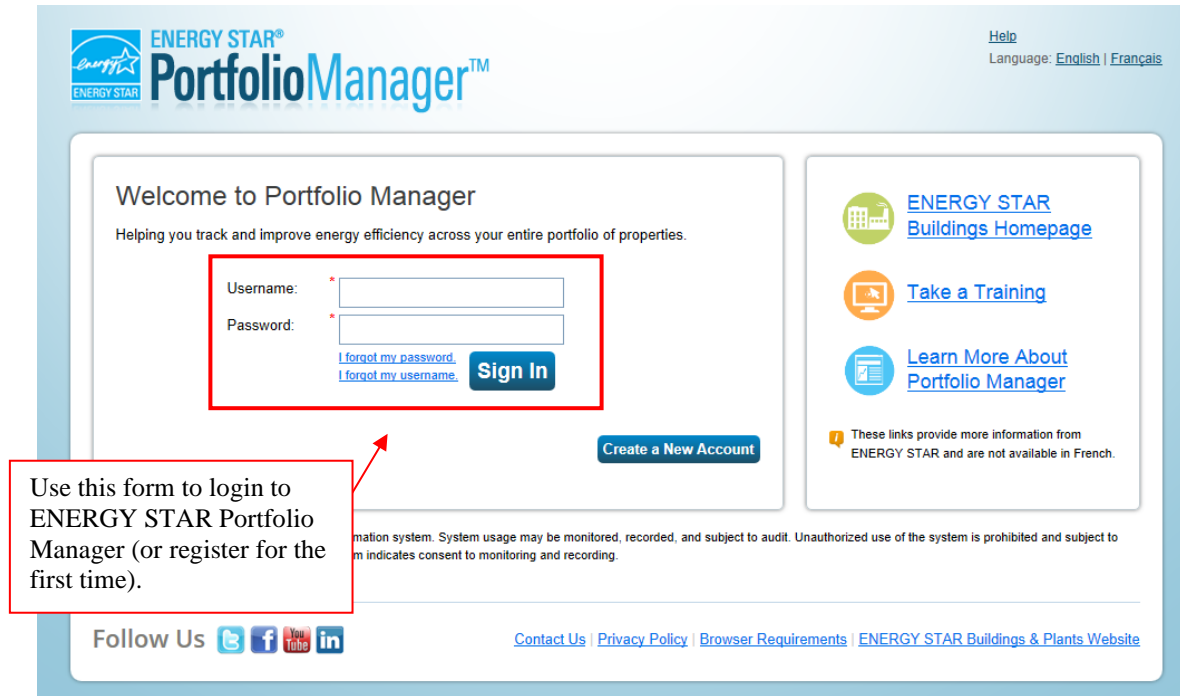


Figure 1: ENERGY STAR Portfolio Manager Homepage

ADDING A FACILITY/PROPERTY

If a facility does not already exist in Portfolio Manager, the user can use the 'Add a Property' link to create an entry in Portfolio Manager for that single facility.

Click the 'Add a Property' selection located near the top of the main 'My Portfolio' page, as seen in Figure 2.

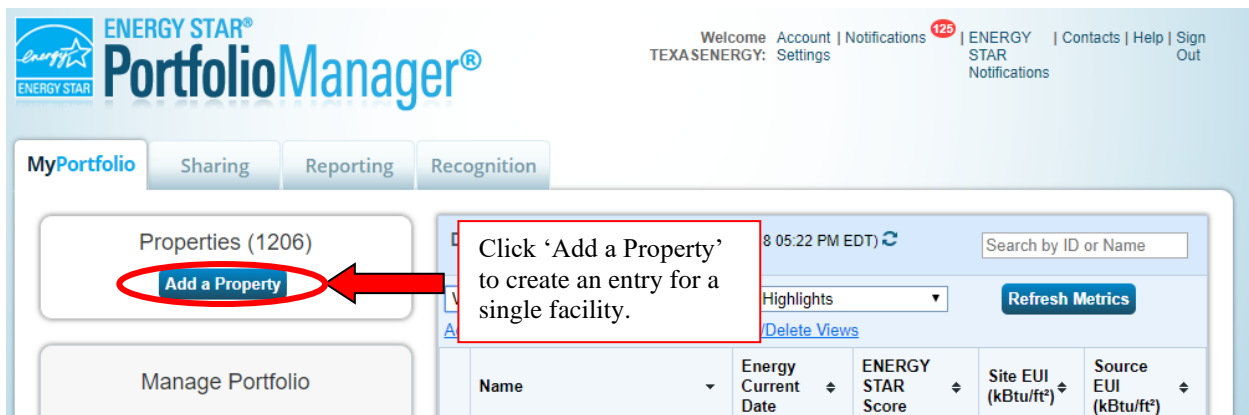


Figure 2: My Portfolio main page

In Figure 3 below, select the primary function of the property (i.e. office, K-12 school, wastewater treatment plant, etc.), whether the property is one or more buildings (i.e. a campus), and whether it is existing or a proposed design. Click **Get Started!** when completed.

ENERGY STAR® PortfolioManager™

Welcome TEXASENERGY: [Account Settings](#) | [Contacts](#) | [Help](#) | [Sign Out](#)

Set up a Property: Let's Get Started!

Properties come in all shapes and sizes, from a leased space in a large office building, to a K-12 school with a pool, to a large medical complex with lots of buildings. Since there are so many choices, Portfolio Manager can walk you through getting your property up and running. When you're done, you'll be ready to start monitoring your energy usage and pursue recognition!

Your Property's Primary Function

We'll get into the details later. For now, overall, what main purpose does your property serve?

Select a primary function

[Learn more about primary functions/property types.](#)

Your Property's Buildings

How many physical buildings do you consider part of your property?

None: My property is part of a building
 One: My property is a single building
 More than One: My property includes multiple buildings

How many?

Your Property's Construction Status

Is your property already built or are you entering this property as a construction project that has not yet been completed?

Existing: My property is built, occupied and/or being used. I will be using Portfolio Manager to track energy/water consumption and, perhaps, pursue recognition.
 Design Project: My property is in the conceptual design phase (pre-construction); I will be using Portfolio Manager to evaluate the energy efficiency of the design project.

Get Started! [Cancel](#)

Tip
To set up a property, you'll need information such as [gross floor area](#) and [operating hours](#). You can use our handy [data collection worksheet](#) in advance, to prepare the information that you will need to complete this process.

Tip
Not sure what kind of property you are? Because we focus on whole building benchmarking, you want to select the property type that best reflects the activity in the majority of your building. Don't worry if you have other tenants with different business types, just select the main activity.

Figure 3: General Facility Information

After clicking **Get Started!**, enter basic property information. Here you can change the property's name, address, and gross floor area.

About Your Design

Name:

Country:

Street Address:

City/Municipality:

State/Province:

Postal Code:

Year Planned for Construction Completion:

Gross Floor Area: Temporary Value

Gross Floor Area is the total floor area, expressed in square feet or square meters, measured from the principal exterior surfaces of the building(s) and not including parking area(s).

Figure 4: About Your Design Tab

Click **Continue** to enter property use details, as seen below in Figure 5 (specific details to be entered will vary depending on the space use selected previously). They must be entered in correctly and accurately in order to be eligible for ENERGY STAR recognition. If ENERGY STAR recognition is not a primary goal, or if precise attribute values are initially unknown, default values may be used temporarily.

Property Use Details

In order to provide you with metrics about your design, we need to know how the space in this property will be used. Based on the property selected, we are assuming this is how the floor area of this property will be used. If your property has multiple property uses you can add them to correctly classify the square footage of your design property.

Click Edit Name to edit existing use.

Click 'Add' to add a new use within a facility.

Building Use [Edit Name](#)

Add Another Type of Use

K-12 School refers to buildings or campuses used as a school for Kindergarten through 12th grade students. This does not include college or university classroom facilities/laboratories, or vocational, technical, trade, adult, or continuing education schools.

Gross Floor Area should include all space within the building(s), including classrooms, administrative space, conference rooms, kitchens used by staff, lobbies, cafeterias, gymnasiums, auditoriums, laboratory classrooms, portable classrooms, greenhouses, stairways, atriums, elevator shafts, small landscaping sheds, and storage areas.

The ENERGY STAR score for K-12 School does not apply to preschool or day care buildings; in order to classify as K-12 school, more than 75% of the students must be in kindergarten or older.

Property Use Detail	Value
★ Gross Floor Area	* <input type="text"/> Sq. Ft. ▼
Gymnasium Floor Area	<input type="text"/> Sq. Ft. ▼ <input type="checkbox"/> Use a default
★ High School	▼ <input type="checkbox"/> Use a default
Number of Workers on Main Shift	<input type="text"/> <input type="checkbox"/> Use a default
Student Seating Capacity	<input type="text"/> <input type="checkbox"/> Use a default
Months in Use	▼
★ Weekend Operation	▼ <input type="checkbox"/> Use a default
★ Number of Computers	<input type="text"/> <input type="checkbox"/> Use a default
★ Cooking Facilities	▼ <input type="checkbox"/> Use a default
★ Number of Walk-in Refrigeration/Freezer Units	<input type="text"/>
★ Percent That Can Be Heated	▼ <input type="checkbox"/> Use a default
★ Percent That Can Be Cooled	▼ <input type="checkbox"/> Use a default
School District	<input type="text"/>

★ This Use Detail is used to calculate the 1-100 ENERGY STAR Score.

Check this box if current attribute value is unknown.

Figure 5: Property use details.

Click **ADD PROPERTY** to finish.

ADDING/EDITING ENERGY METERS

From the **My Portfolio** tab, scroll to the **My Properties** section and click on the property you want to add meters for. Click the **Meters** tab (as seen in Figure 6). To edit an existing meter, click the meter name, as shown below.

The screenshot shows the 'Energy' tab interface. On the left, there is a 'Meter Summary' section with '2 Energy Meters Total' and '2 - Used to Compute Metrics'. Below this is a 'Four Ways to Enter Bill Data' section with four numbered options. A red box highlights the text 'Click meter name to edit utility meter to a single facility.' with a yellow arrow pointing to the 'Elem 1' meter name in the table below. To the right, there is a line chart titled 'Energy Use by Calendar Month' showing 'Site Energy (kBtu)' on the y-axis (0k to 400k) and months on the x-axis (Dec '16 to Dec '17). Two lines are plotted: 'Natural Gas' (red) and 'Electric - Grid' (blue). Below the chart is a table titled 'Meters - Used to Compute Metrics (2)'. A yellow circle highlights the 'Add A Meter' button in the top right corner of the interface. Another yellow circle highlights the 'Elem 1' meter name in the table. A red box highlights the text 'Click 'Add Meter' to add a utility meter to a single facility.' with a yellow arrow pointing to the 'Add A Meter' button.

Name	Meter ID	Energy Type	Most Recent Bill Date	In Use? (Inactive Date)
Elem 1	3689472	Electric - Grid	12/31/2017	Yes
NG Meter ES 1	37964483	Natural Gas	12/31/2017	Yes

Figure 6: Adding an Energy Meter from the Meters Tab

Start setting up the meters, by choosing your energy sources and number of meters, then click on **Get Started!**

Get Started Setting Up Meters for test

There are four ways to enter meter data. First, you can enter manually, starting below. Second, you can set up you specially formatted spreadsheet with just your bill data. Third, for advanced users, you can use our upload tool the meters and enter bill data. And finally, you can hire an organization that exchanges data to update your energy d

Sources of Your Property's Energy

What kind of **energy** do you want to track? Please select all that apply.

- Electric
 - purchased from the grid

How Many Meters?
 - generated onsite with my own solar panels
 - generated onsite with my own wind turbines
- Natural Gas
- Propane
- Fuel Oil (No. 2)
- Diesel
- District Steam
- District Hot Water
- District Chilled Water
- Fuel Oil (No. 4)
- Fuel Oil (No. 5 and No. 6)
- Coal (anthracite)
- Coal (bituminous)
- Coke
- Wood
- Kerosene
- Fuel Oil (No. 1)
- Other:

Figure 6: Select the types and numbers of meters to add.

Select the type, units, the first bill date, and put a checkmark if the meter is still in use. Click **CONTINUE** to begin adding billing info.

About Your Meters for test

Enter the information below about your new meters. The meter's units and first bill date are required. You can also change the meter's name.

2 Energy Meters for test (click table to edit)

<input type="checkbox"/>	Meter Name	Type	Other Type	Units	First Bill Date	In Use?	Last Bill Date	Enter as Delivery?
<input type="checkbox"/>	Electric Grid Meter #	Electric - Grid		<input type="text"/>	<input type="text"/>	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="checkbox"/>
<input type="checkbox"/>	Electric Grid Meter #2	Electric - Grid				<input checked="" type="checkbox"/>		<input type="checkbox"/>

[X Delete Selected Entries](#)
[+ Add Another Entry](#)

Figure 7: Configuring meter entries

Your Meter Entries for test

Now we need actual energy consumption information in order to start providing you with your metrics and, possibly, your score!

2 Energy Meter(s) for test

Electric Grid Meter #1 [Edit](#) [Delete Meter](#)

<input type="checkbox"/>	Start Date	End Date	Usage	Cost	Estimation	Green Power
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> KWh (thousand Watt-hours)	\$ <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>

[Delete Selected Entries](#) [Add Another Entry](#) You can upload an excel spreadsheet with your basic bill information using our [spreadsheet template](#) No file chosen

Electric Grid Meter #2 [Edit](#) [Delete](#)

[Cancel](#)

Figure 8: Entering energy data

Electric Service

Meter #	Read Date	Reading
	06/22/2011	1691.00
	05/23/2011	1609.00
	Read Difference	82.00
	KWH Multiplier	160
	Total Consumption in KWH	13,120
	Demand Usage	52.800

Billing Rate: Gen Svc Demand Summer

Energy Charge	13,120.00 @ \$.0180000 per KWH	\$236.16
Demand Charge	52.80 @ \$14.0300000 per KW	\$740.78
Fuel Charge	13,120.00 @ \$.0310500 per KWH	\$407.38
Transmission Service Cost Adj	52.80 @ \$.2668000 per KW	\$14.09
TOTAL CURRENT CHARGES - Electric		\$1,398.41

Figure 9: Sample facility utility bill

GENERATING A STATEMENT OF ENERGY PERFORMANCE

A Statement of Energy Performance (SEP) is a required document in applying for ENERGY STAR recognition. It can also be used for purposes other than applying for ENERGY STAR, such as formalizing information regarding a facility's energy performance or energy and environmental performance impacts.

On the home page, select the **MyPortfolio** tab and click on the property you want to generate a SEP for (You may already be in here). Now click on the **Goals** tab. To the left you will see a section named **Generate & Download Performance Reports for Property**.

The screenshot shows the 'Goals' tab selected in the top navigation bar. On the left, the 'Generate & Download Performance Documents for this Property' section contains a list of report options. A red arrow points to the 'Statement of Energy Performance (SEP)' link, which is circled in red. Other options include 'ENERGY STAR Scorecard', 'Progress & Goals Report', 'Data Verification Checklist', and 'Water Scorecard'.

The main content area displays 'Metrics Comparison for Your Property & Your Target' with a 'Change Time Period' link. Below this is a table with the following data:

Metric	Jul 31 2010 (Energy Baseline)	Dec 31 2017 (Energy Current)	Target*	Median Property*
ENERGY STAR score(1-100)	Not Available	15	75	50
Source EUI(kBtu/ft ²)	Not Available	240.3	132.4	169.2
Site EUI(kBtu/ft ²)	Not Available	96.1	53.0	67.7
Source Energy Use(kBtu)	Not Available	10813699.3	5956044.6	7616225.6
Site Energy Use(kBtu)	Not Available	4326583.8	2383026.0	3047267.8
Energy Cost(\$)	Not Available	79881.06	43997.42	56261.24
Total GHG Emissions(Metric Tons CO ₂ e)	Not Available	528.3	291.0	372.1

* To compute the metrics at the target and median levels of performance, we will use the fuel mix associated with your property's current energy use.

Below the table is the 'Current Baselines & Targets' section with the following table:

	Baselines	Target
Energy	07/31/2010	75
Water	Not Available	Not Available

Figure 10: Generating a Statement of Energy Performance from the Facility page

Select Statement of Energy Performance (SEP). In the next page, select the reports to download, the property, the timeframe, and the contacts for the report. Click **Generate & Download Report(s)**

Generate and Download Reports

Portfolio Manager offers several standard reports for properties that can be useful in communicating your property's detailed information about your property for a single time period and are presented in a PDF format. [You can](#)

1 Select Report(s) to Download

- Statement of Energy Performance (SEP)
- ENERGY STAR Data Verification Checklist
- ENERGY STAR Scorecard
- Progress and Goals Report
- Statement of Energy Design Intent (SEDI)
- Water Scorecard

2 Select Property for Report(s)

Property: *

3 Select Timeframe for Report(s)

Timeframe: * for:

4 Select Contacts for Report(s)

Select Property Contacts:

Primary Contact: [Add Contact](#)
Property Owner: [Add Organization](#)
Verifying Professional: [Add](#)

Click **GENERATE REPORT**.

[Cancel](#)

Figure 11: Setting up Statement of Energy Performance

SETTING ENERGY PERFORMANCE BASELINES AND TARGETS

An energy 'Baseline Period' for a facility is a 12-month period of complete energy data that can be compared to a facility's current energy performance or specified goal. To set a baseline period for a particular facility, click on the **Goals** Tab, scroll to the **Current Baselines & Targets** section, and click on **Set Baselines or Target**. 'Set Baseline Periods' on the main facility page (as shown below).

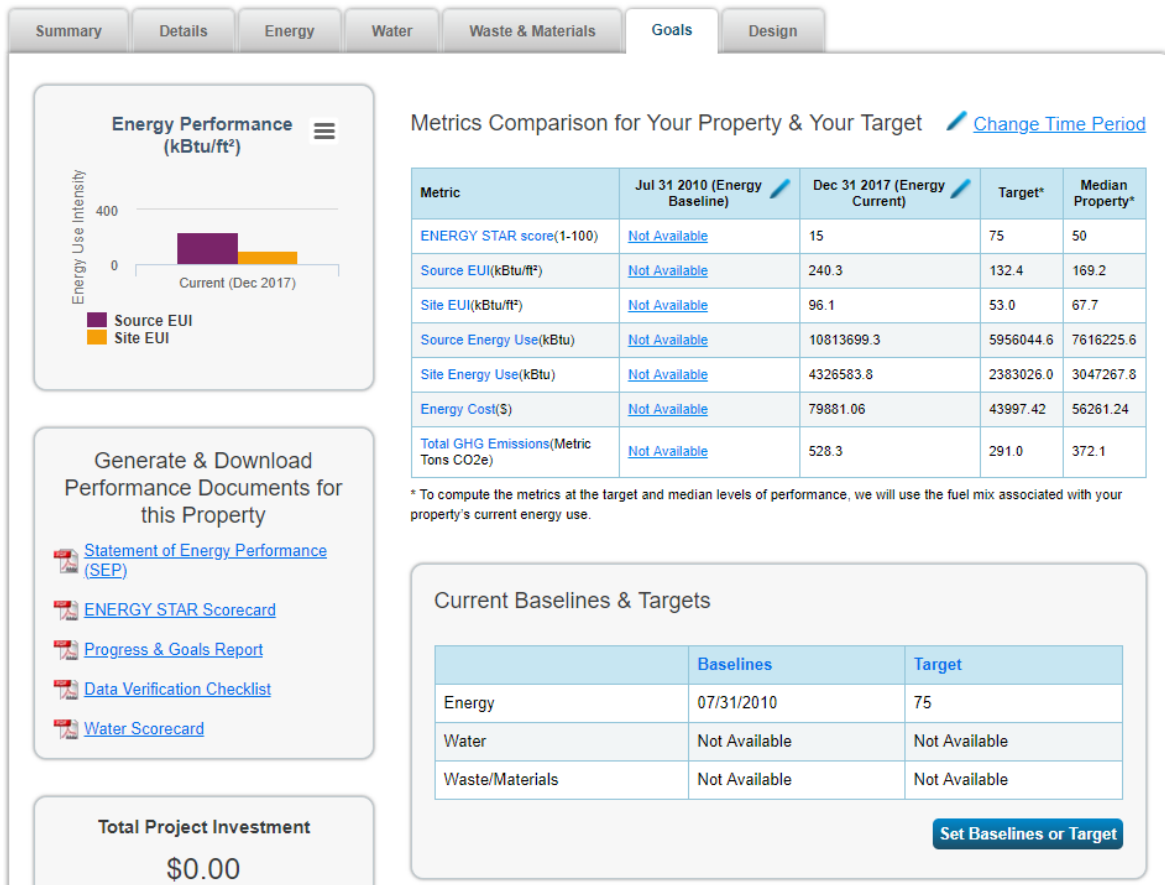


Figure 12: Use the goals tab to set goals and view progress from a baseline period.

In the new window, scroll to the **Baselines** section. Use the drop down menu to select an Energy Baseline Period from which to compare to current consumption and your goal metric.

Set Performance Baseline & Target

To establish a performance target, you must first set a baseline for comparison. Then, you can establish a per target reduction (%). The energy use and costs displayed reflect required levels to meet either the target rating

The screenshot shows the 'Baselines' section of a software interface. It has two main parts: 'Energy Baseline:' and 'Water Baseline:'. Under 'Energy Baseline:', there are two radio button options. The first option is selected and is circled in yellow with a yellow arrow pointing to it. This option is 'Select a baseline:' followed by a dropdown menu showing '07/31/2010'. Below this is a red warning icon and text: 'Baseline dates are only available for periods of 12 full months of energy consumption information entered in your meters.' The second option is 'Let Portfolio Manager automatically set my baselines'. Under 'Water Baseline:', there is text: 'You must have at least one water meter to select water baselines. After you [add a meter](#), don't forget to [associate your meter](#) as well.'

Figure 13: Setting a baseline period for a single facility from the Facility page

The user can choose one of two methods to set an energy performance target: by ENERGY STAR rating or target reduction (%). Click the desired method, and specify a desired target (as seen below). Click **Save & Calculate Other Metrics** to view the baseline, current, target, and median metrics such as EUI, energy star score, and greenhouse gas (GHG) emission statistics for your building type.

Specify a target here and click "Save & Calculate Other Metrics"

Select either target score or target reduction here

Target Metric: * Target ENERGY STAR Score ▾

Target Value: * 75 1-100 value

Save & Calculate Other Metrics

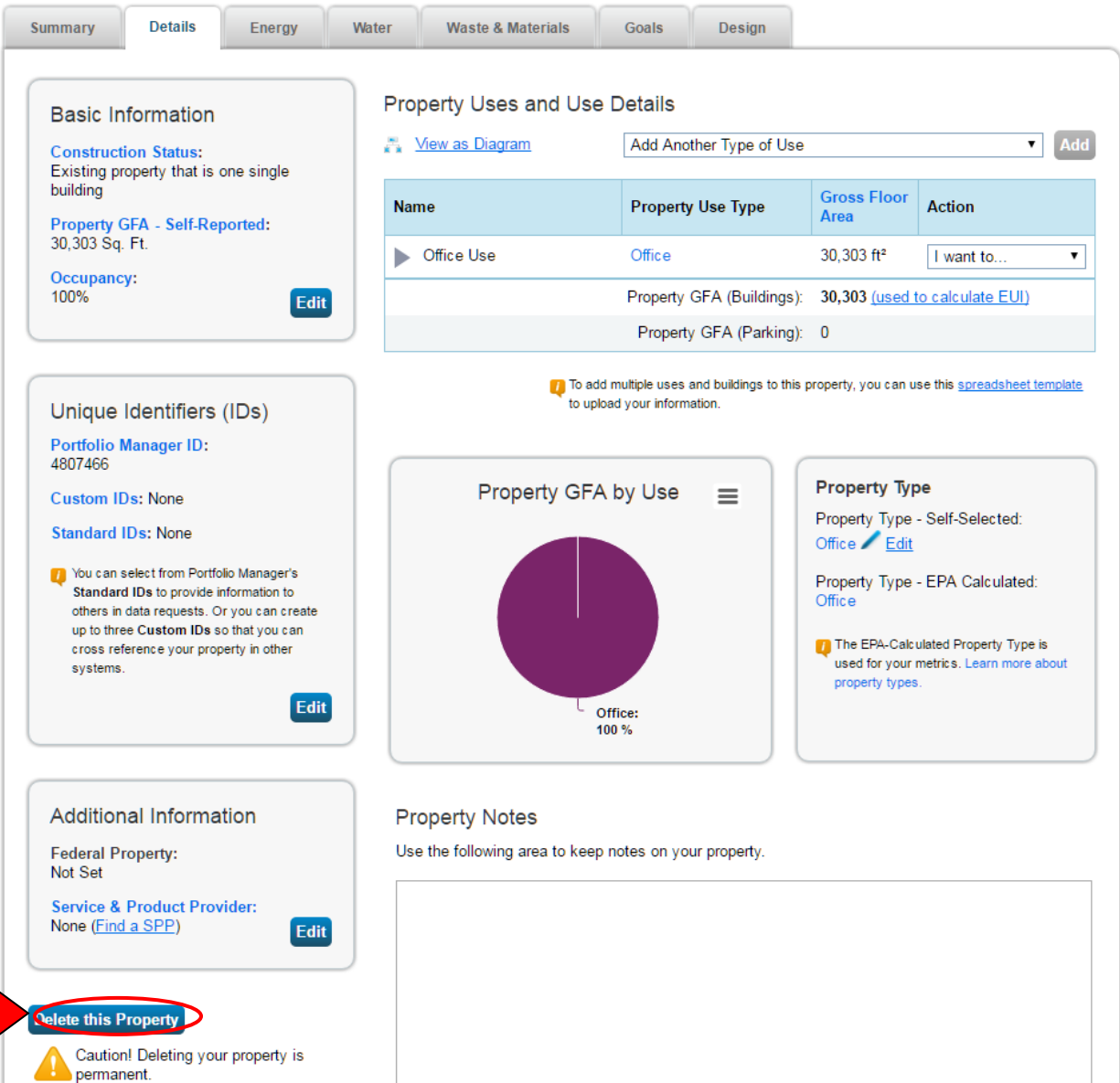
🔔 Select "Calculate Other Metrics" to refresh the table after making changes to "Target Metric" and "Target Value"

Metric	Baseline (Jul 2010)	Current (Jul 2010)	Target*	Median Property*
ENERGY STAR score (1-100)	55	55	75	50
Source EUI (kBtu/ft²)	173.6	173.6	143.2	183.1
Site EUI (kBtu/ft²)	55.3	55.3	45.6	58.3
Source Energy Use (kBtu)	34712323.8	34712323.8	28640000	36620000
Site Energy Use (kBtu)	11054880.2	11054880.2	9120000	11660000
Energy Cost (\$)	323999.9905	323999.9905	267168.15656636556	341735.101979989
Total GHG Emissions (MtCO2e)	1743.1	1743.1	1437.34823261	1838.5138078

Figure 14: Setting an Energy Performance Target for a single facility

DELETING A FACILITY, SPACE, OR METER

Deleting a property from Portfolio Manager will delete *everything* associated with that particular property, including general information (address, year built, type of property), any spaces designated within the facility, and any Energy/Water meters. To delete a property, click on the property you want to delete, select the **Details** tab, and click on the **Delete this Property** button on the bottom left corner, as shown in Figure 15 below.



The screenshot displays the 'Details' tab of a property in Portfolio Manager. The interface is organized into several sections:

- Basic Information:** Construction Status (Existing property that is one single building), Property GFA - Self-Reported (30,303 Sq. Ft.), Occupancy (100%).
- Unique Identifiers (IDs):** Portfolio Manager ID (4807466), Custom IDs (None), Standard IDs (None).
- Additional Information:** Federal Property (Not Set), Service & Product Provider (None).
- Property Uses and Use Details:** A table with columns for Name, Property Use Type, Gross Floor Area, and Action. It lists 'Office Use' with a Gross Floor Area of 30,303 ft². Below the table, it shows Property GFA (Buildings) as 30,303 (used to calculate EUI) and Property GFA (Parking) as 0.
- Property GFA by Use:** A pie chart showing 100% Office.
- Property Type:** Property Type - Self-Selected (Office) and Property Type - EPA Calculated (Office).

A red arrow points to the **Delete this Property** button in the bottom left corner. Below this button is a caution message: **Caution! Deleting your property is permanent.**

Figure 15: Deleting a facility from the Facility page

ONLINE HELP

ENERGY STAR provides a detailed 'HELP' section online, as seen in Figure 16.

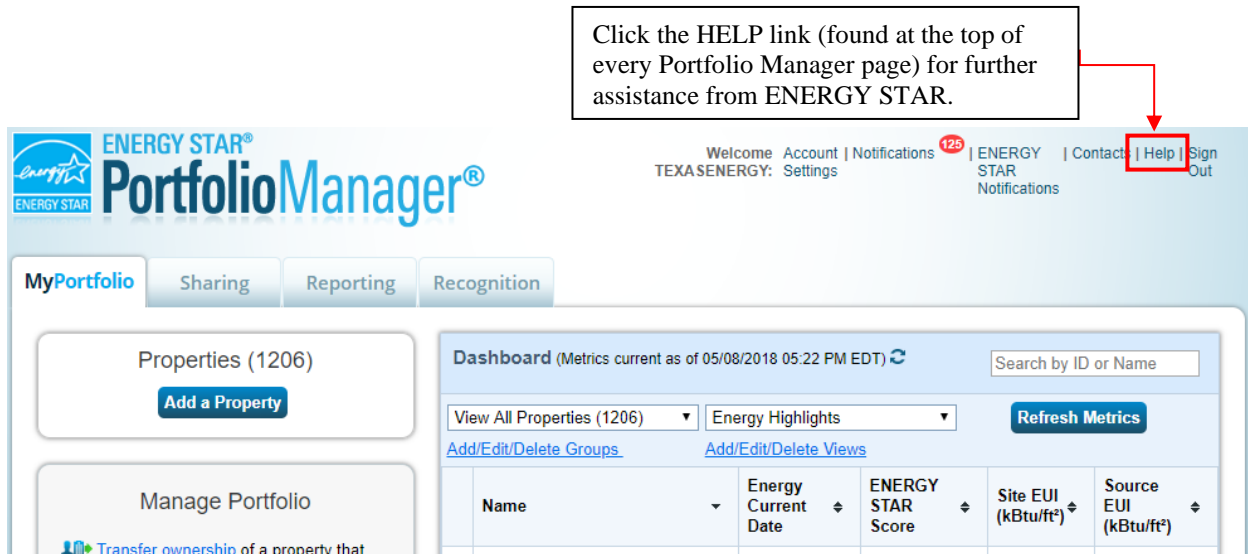


Figure 16: ENERGY STAR Portfolio Manager Help Section

It can also be found at the following link:

https://www.energystar.gov/istar/pmpam/help/portfolio_manager_online_help.htm

The information found in this section provides a wealth of information regarding operation of Portfolio Manager, including a glossary of terms, step-by-step tutorials, instructions for applying for ENERGY STAR recognition, and managing user accounts. It also includes a 'Search' function, which allows the user to locate applicable Help topics.