

SECO – Energy Topics

Funding Opportunities and Select Analysis

Nov 1, 2018



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Introductions



- Welcome
- Presenter Introductions
- Thanks to NCTCOG & Texas Energy Aggregation
- Introduction to the State Energy Conservation Office (SECO)

Agenda



1. Overview of SECO

- SECO Schools and Local Government Program
- SECO LoanSTAR Revolving Loan Program

2. Changes in HVAC Design

- Schools and Local Governments Considerations

3. Utility Rate Analysis

- Basic Method



North Central Texas
Council of Governments

SECO – Schools and Local Governments Program

RENEWABLE PROJECTS QUALIFY

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SECO – Schools & Local Governments Program



STATE ENERGY CONSERVATION OFFICE

SECO partners with Texas local governments, county governments, public K-12 schools, public institutions of higher education and state agencies, to reduce utility costs and maximize efficiency. SECO also adopts energy codes for single-family residential, commercial, and state-funded buildings.



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



Funding & Incentives

SECO Funding Opportunities
LoanSTAR Revolving Loan Program
Other Funding Resources



Programs

Alternative Fuels Program
Clean Energy Incubators
Industrial Energy Efficiency
Innovative Energy Demonstration Program
Local Governments Program
Schools Program
State Agency and Higher Ed. Program
Pantex Program



Energy Codes

Training & Code Compliance
Energy Code Adoption Process
Code Contacts
Commercial & Multi-Family Construction
Single-Family Construction
State-Funded Buildings
Local Ordinances
Texas Water Conservation Standards



Energy Reporting

State Agencies and Institutions of Higher Ed.
Local Government
Utilities
Schools



Resources

Combined Heat and Power in Texas
Energy Efficiency Best Practices Guide
Energy Savings Performance Contracting
SECO Reports
Remote Energy Audits



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SECO – Schools & Local Governments Program

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TECHNICAL ASSISTANCE FOR LOCAL GOVERNMENTS

SECO makes energy engineering expertise available to political subdivisions in Texas through its Technical Assistance Program (TAP). Eligible public entities include municipalities, counties, and other special-purpose districts such as port and transit authorities and airports.

SECO contracts with leading engineering firms having a high degree of technical knowledge. They provide customized, on-site, energy-related services across a broad spectrum, ranging from basic consultation to feasibility studies.

Officials of eligible entities may request assistance with either energy or water-related technical matters. Upon determination that the requested services are reasonable and within the contractors' scope of work, SECO will assign an engineer to contact the officials to determine the level of service necessary to provide assistance. There is no charge to the entity.

How to Apply


To initiate participation in the program, complete the Technical Assistance Request Form and email it to [Stephen Ross](#).

[Download Technical Assistance Request Form \(PDF\)](#)

For more information about TAP, contact Program Manager [Stephen Ross](#).

Technical Assistance Service Request Form

Form# 50-855



State Energy Conservation Office

Public Entity Name		Telephone	
Contact Person		Title	
Email Address		Country	
Street Address	City	State	ZIP Code
Mailing Address	City	State	ZIP Code

Description of Technical Assistance Needs

Technical Assistance Eligibility

The State Energy Conservation Office (SECO) provides free technical assistance 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; 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?	<input type="radio"/> Yes	<input type="radio"/> No
Is the primary contact familiar with SECO's LoanSTAR revolving loan program?	<input type="radio"/> Yes	<input type="radio"/> No
Has this organization used SECO's LoanSTAR revolving loan program in the past?	<input type="radio"/> Yes	<input type="radio"/> No

Signature

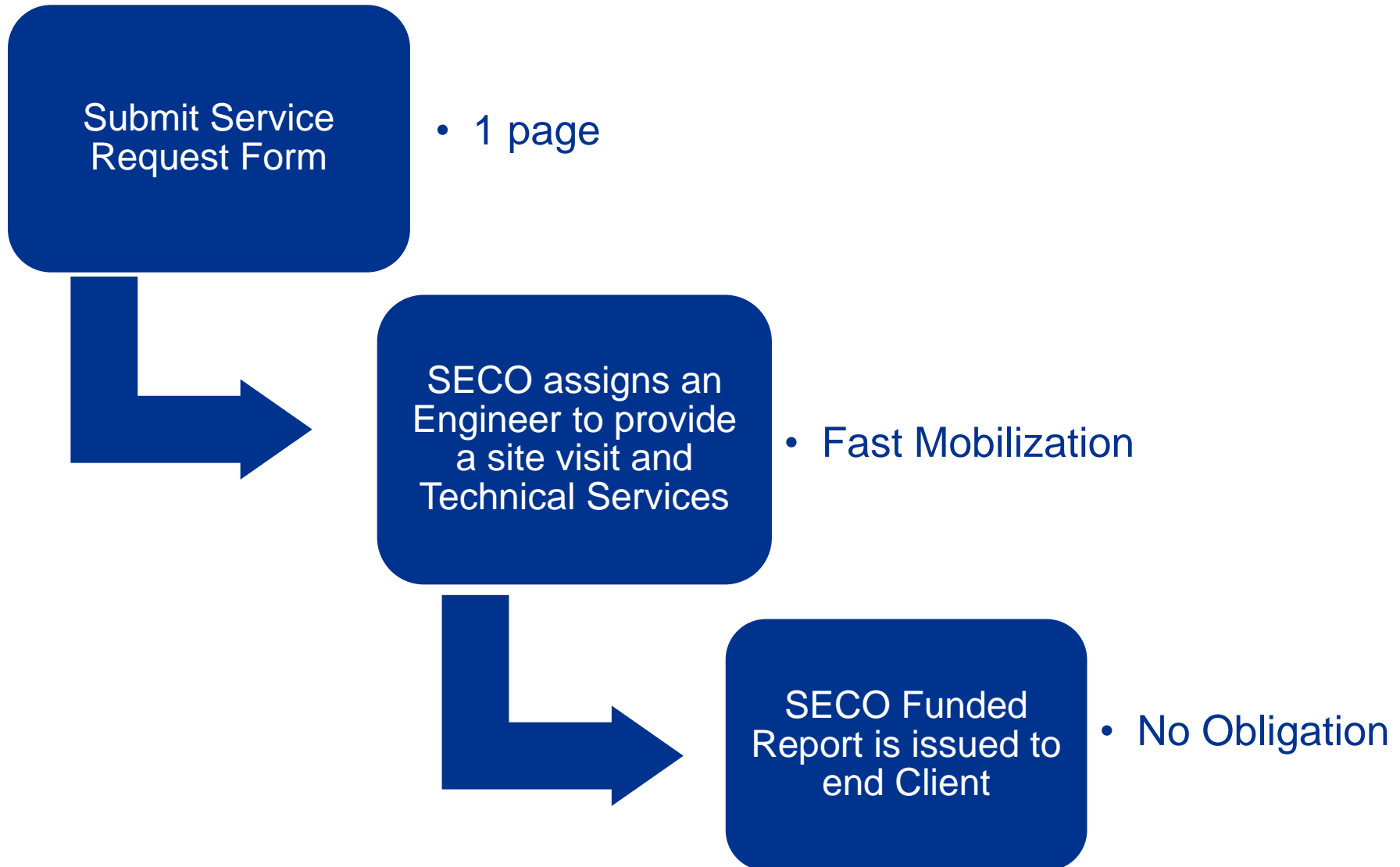
This agreement must be signed by your organization's chief executive officer or other signing authority.

Signature	Date
Print Name	Title

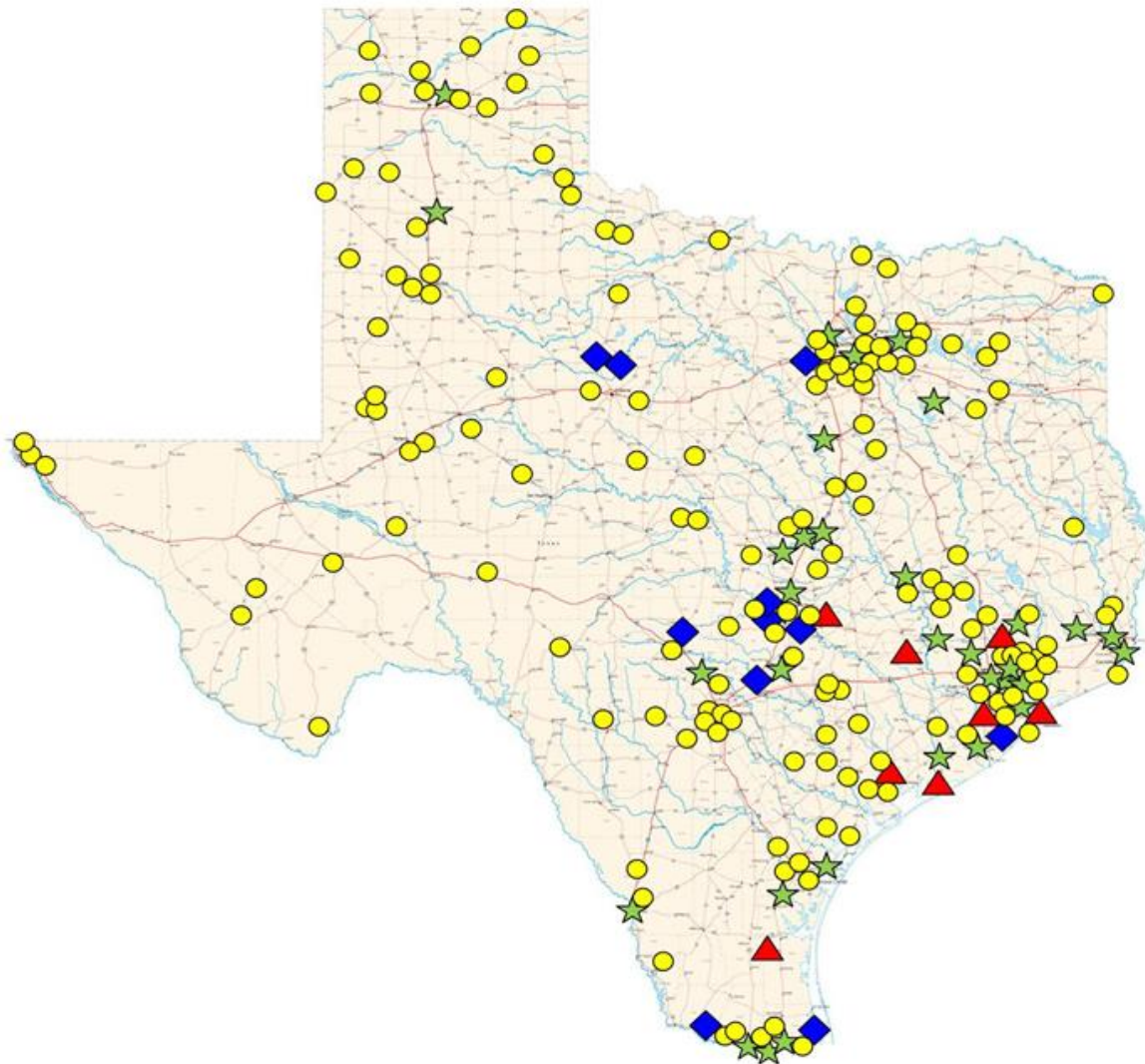
Submit completed forms to SECO at Stephen.Ross@cpa.texas.gov
or by mail to: State Energy Conservation Office
Attn: Stephen Ross
111 E. 17th Street
Austin, TX 78711-1440

50-855 (06-1712)

SECO – Schools & Local Governments Program



SECO – Schools & Local Governments Program



PEA Completions:

★	Municipalities
▲	Counties
◆	Special Districts
●	Independent School Districts

Total Square Feet Assessed:

28M sq ft

Annual Energy Savings:

213,266 MMBtu

Annual Water Savings:

71 Million Gallons

Identified Potential Annual Savings (2014 – 2016)



**North Central Texas
Council of Governments**

SECO – LoanSTAR Revolving Loan Program

SECO – LoanSTAR Revolving Loan Program

Programs

STATE ENERGY CONSERVATION OFFICE

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Funding & Incentives

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Programs

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Energy Codes

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SECO – LoanSTAR Revolving Loan Program

Availability and Interest Rates

- Issuance: October 19, 2018
- Deadline: August 31, 2019 at 2:00 p.m. CT
- **Maximum Loan Amount: \$8.0 million**
- **Maximum 3 loans per borrower per application period**
- Recent NOLFA Interest Rates
 - 2% interest
 - 1% interest (ARRA restrictions and reporting)

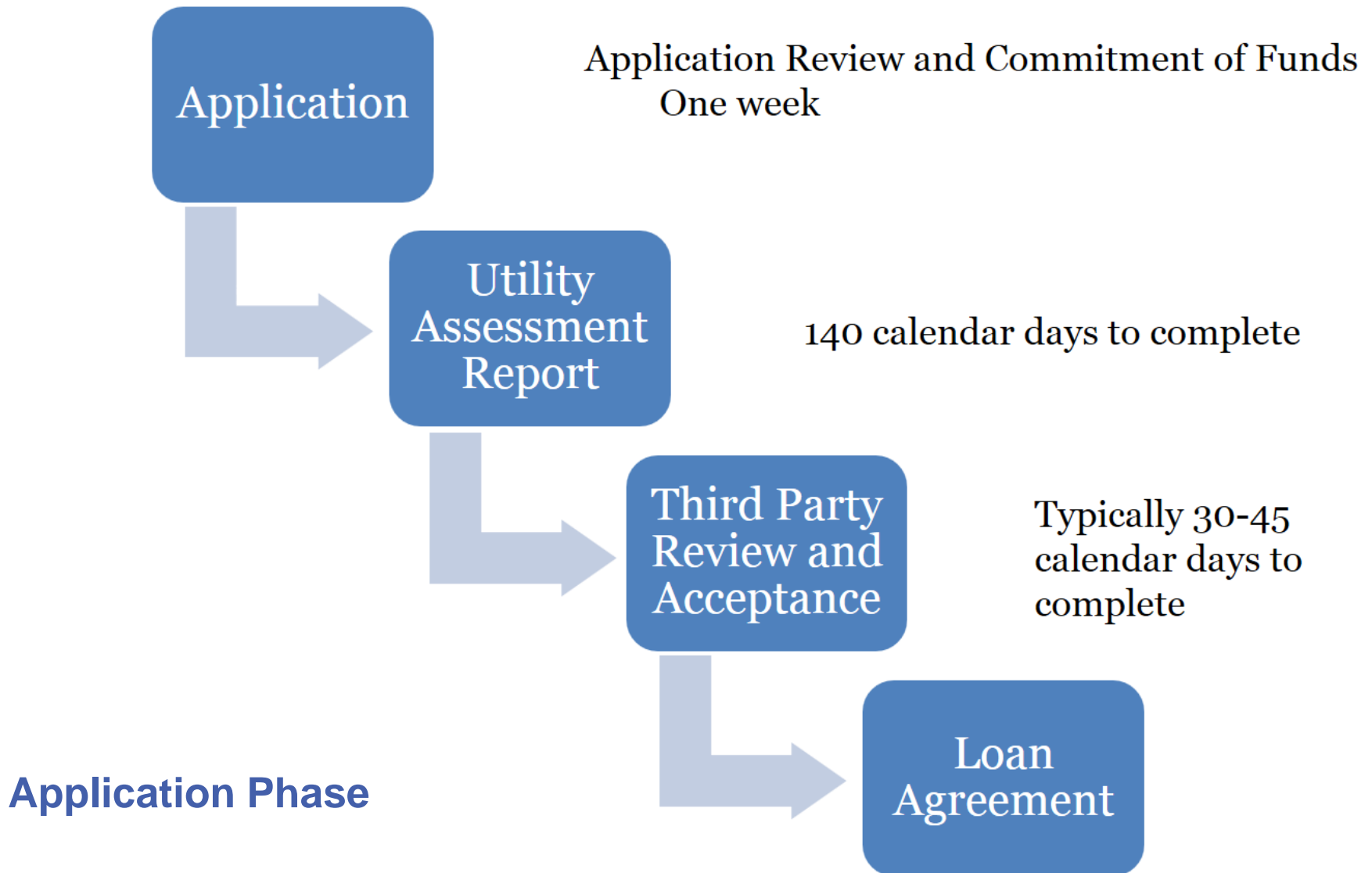
SECO – LoanSTAR Revolving Loan Program

300 loans, Over \$400 million

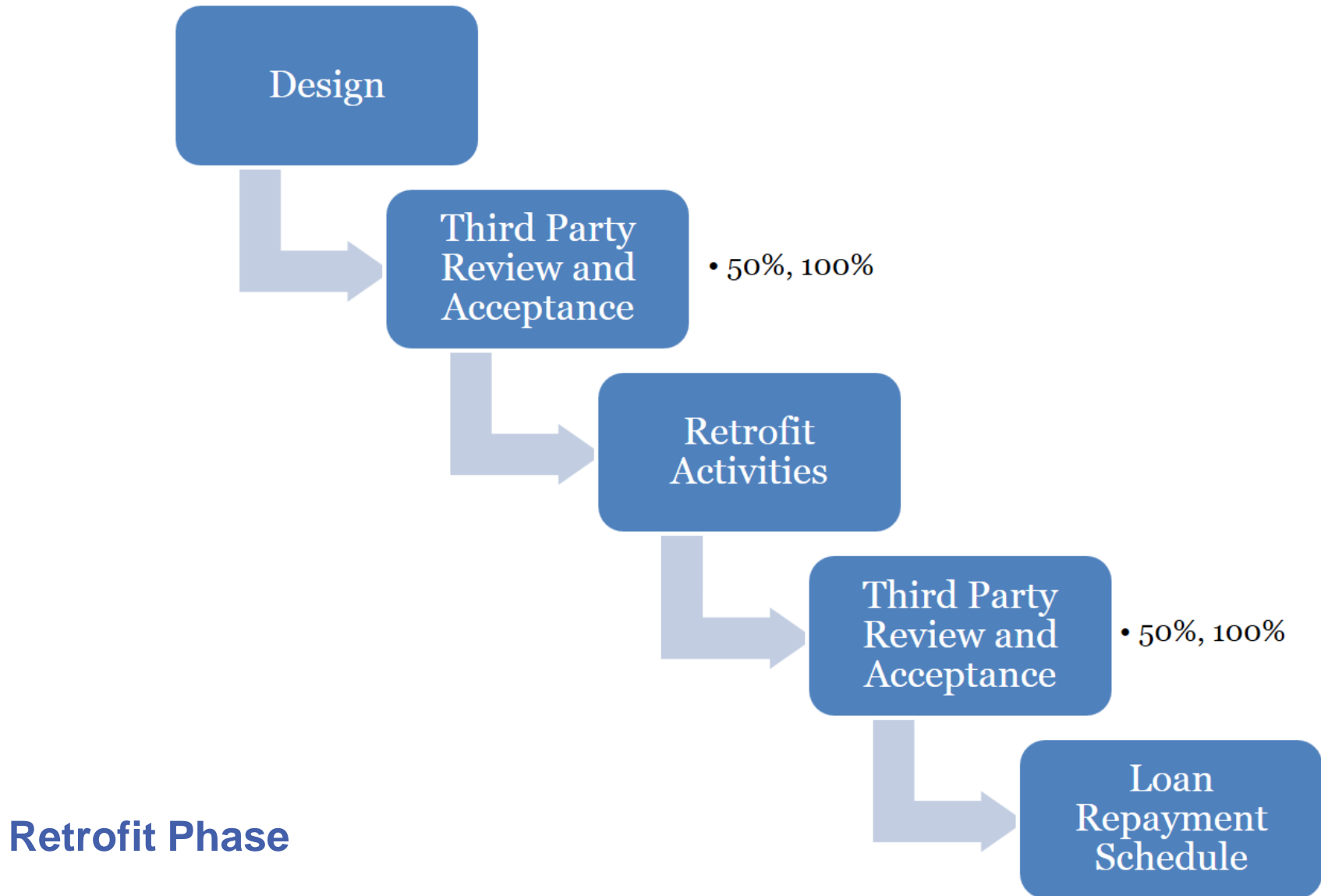
Borrower	Number of Loans	Average Simple Payback (years)
K-12 Public Schools	134	8
State Agencies	72	7
Local Governments	57	9
Higher Education	14	9
Hospitals	13	8

Borrower	Number of Design Build or Design Bid Build Contracts	Number of Energy Savings Performance Contracts
K-12 Public Schools	126	8
State Agencies	59	13
Local Governments	41	16
Higher Education	13	1
Hospitals	12	1

SECO – LoanSTAR Revolving Loan Program



SECO – LoanSTAR Revolving Loan Program

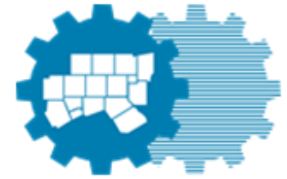


Texas State Energy Conservation Office (SECO)
<https://comptroller.texas.gov/programs/seco>

Dub Taylor - Director
512.463.8352
dub.taylor@cpa.texas.gov

Stephen Ross – Schools and Local Governments
512.463.1770
stephen.ross@cpa.texas.gov

Eddy Trevino – Manager; LoanSTAR
512.463.1876
eddy.Trevino@cpa.texas.gov



**North Central Texas
Council of Governments**

HVAC Design Changes

Schools and Local Governments Considerations

Nov 1, 2018

Presented by:

Mack Wallace, PE
Program Manager
Jacobs Engineering Group,
Fort Worth, TX

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What's Happening?

Changes in HVAC Design
And
What they mean to you

From 2004 to 2013, Eight Climate Zones for 90.1

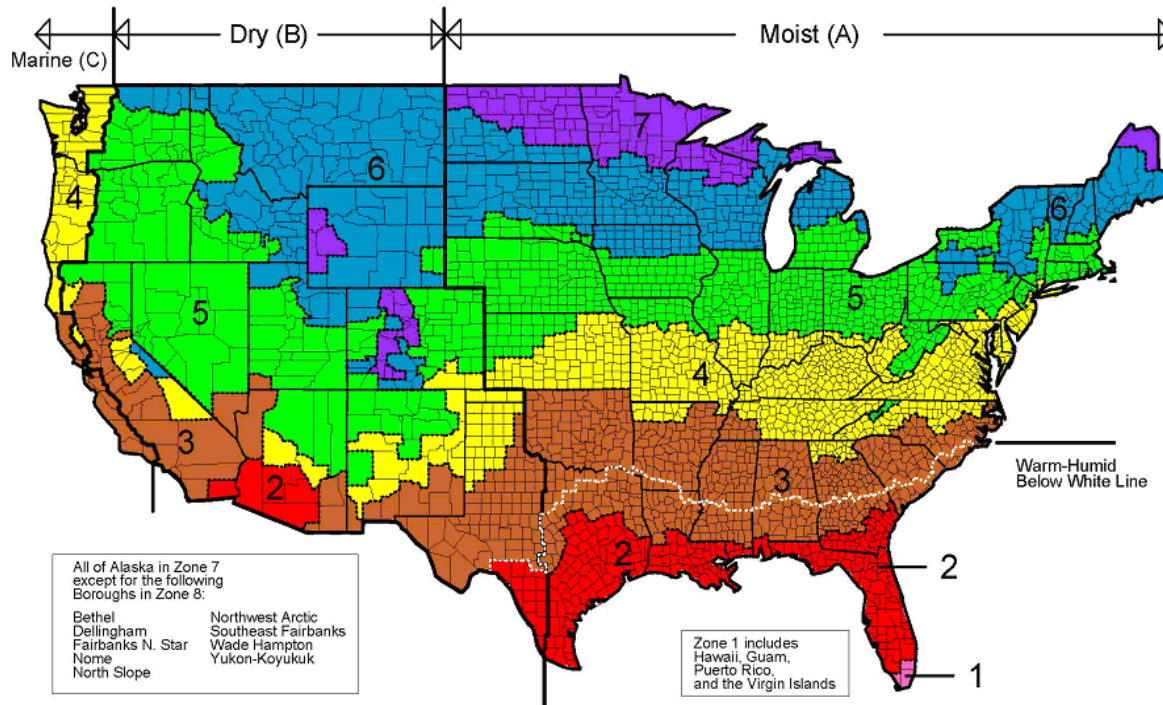


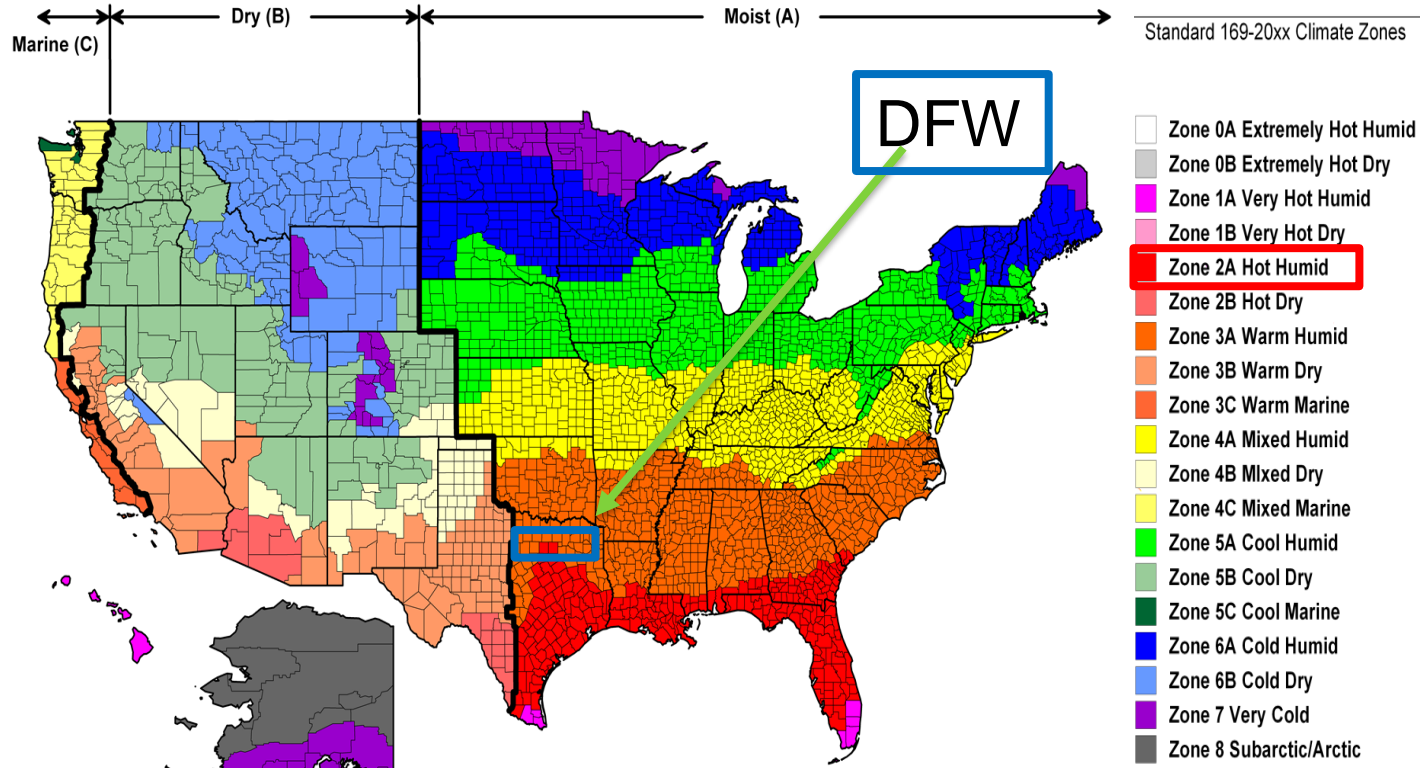
Figure B-1 Climate Zones for United States Locations (Page 134 of Std. 90.1-2010)

ASHRAE 90.1 and the IECC agreed on this map



New 9 Climate Zones— Standards 169-2013 and 90.1-2016

New for 2016



The IECC 2018 did not change climate zones

50% AEDGs 7 years old

Posted originally, 4/28/11

Reposted with minor changes, 9/27/11

Reposted with errata dated 2/19/14 incorporated, 2/19/2014



Advanced Energy Design Guide for Small to Medium Office Buildings

**Achieving 50% Energy Savings
Toward a Net Zero Energy Building**

Net Zero - 2018 AEDG – Schools First

Posted originally, 1/11/2018

Reposted with errata dated 1/31/18 incorporated, 2/1/2018

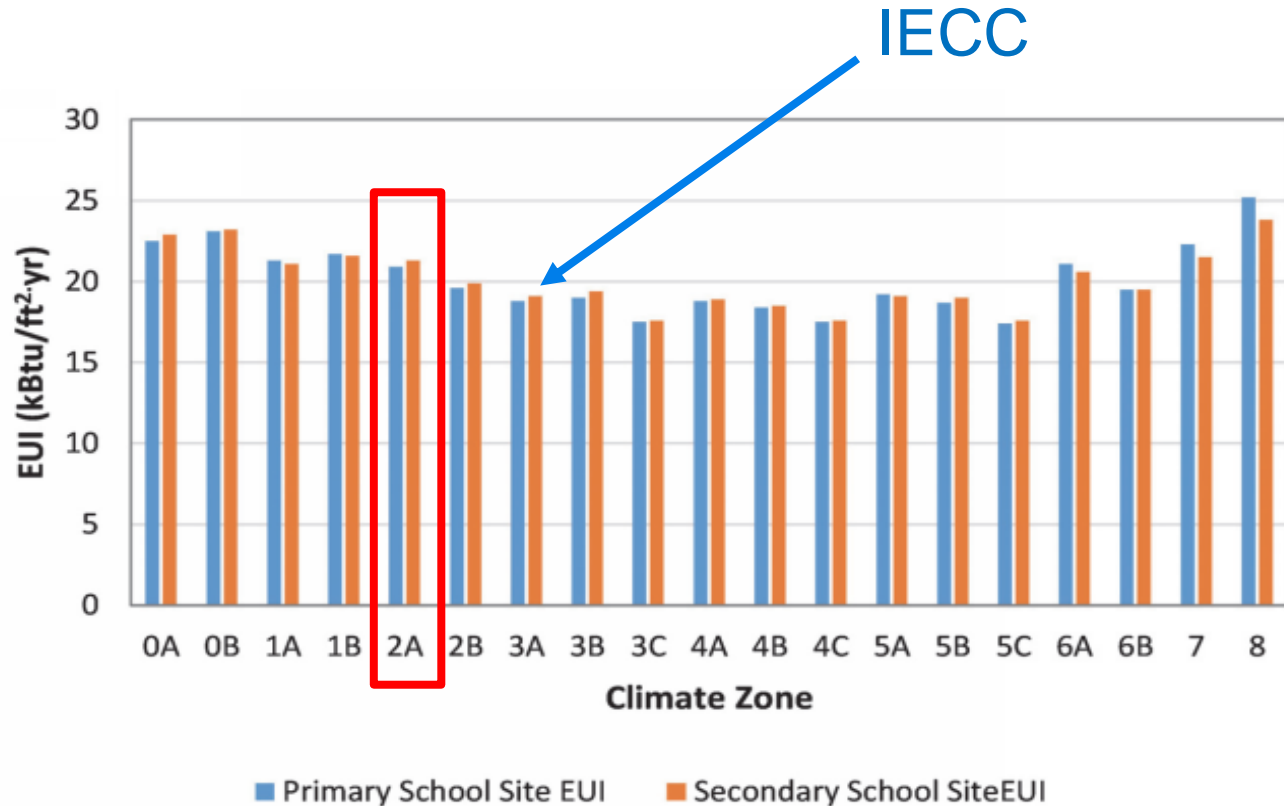
ACHIEVING
ZERO ENERGY

**Advanced Energy Design Guide
for K–12 School Buildings**



Target Site EUI

6 | Advanced Energy Design Guide for K-12 School Buildings



Right here in DFW – page 21 of the AEDG

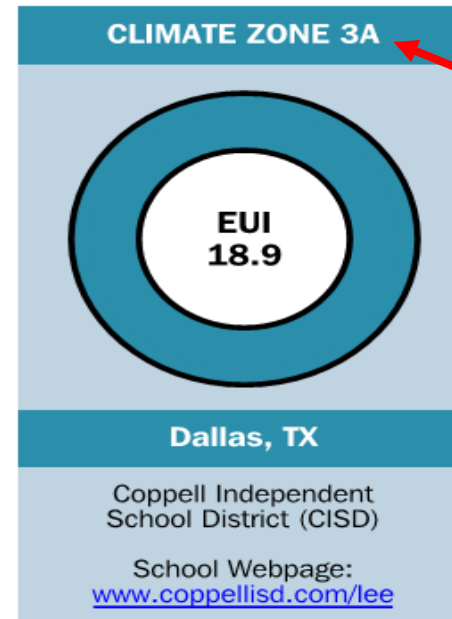
RICHARD J. LEE ELEMENTARY SCHOOL

The Coppell Independent School District (CISD) set out to construct a sustainable 21st Century school that is sustainable, while providing the best educational environment for the students. The floor plan is arranged in eight “neighborhoods” with collaborative teaching spaces that each open up into a large multipurpose learning space.

The 358 KW solar photovoltaic (PV) system is composed of approximately 1100 panels, all roof mounted. The entire PV system was constructed within the allocated budget.

KEY ENERGY EFFICIENCY AND SUSTAINABLE FEATURES

- Variable-speed dedicated outdoor air system (DOAS) with demand-controlled ventilation to provide appropriate outdoor air to the learning environment and control building CO₂
- All spaces can control their temperature and lighting
- Geothermal HVAC
- LED lighting with 0.60 W/ft² lighting power density (LPD)
- Orientation and windows to maximize natural lighting and students’ views
- 2900 W wind turbine
- Recycled products integrated into design
- Reduced construction waste.
- 20,000 gal rainwater storage tank for flushing toilets and urinals



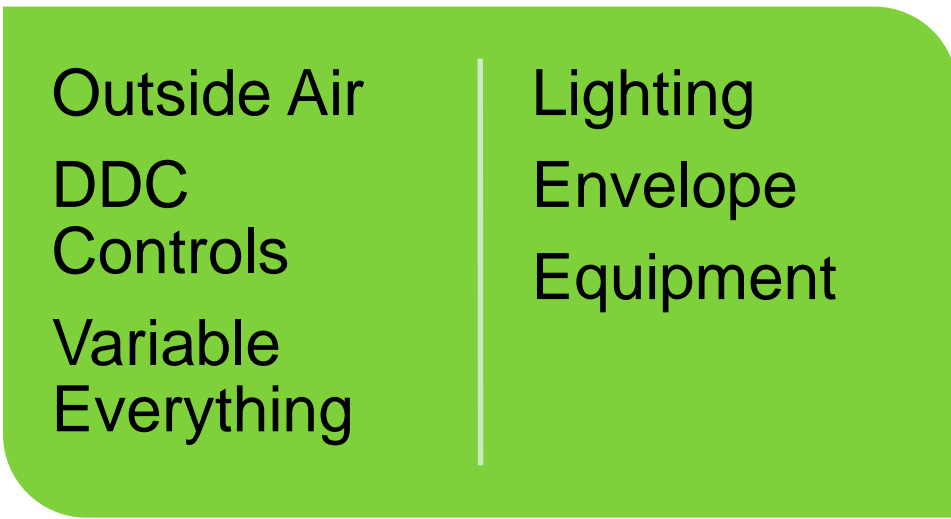
Built in 2014, before the weather changed

Changing in Your Building – HVAC Cost %



Latent Loads

How many of you have a humidistat in your building



Sensible Loads

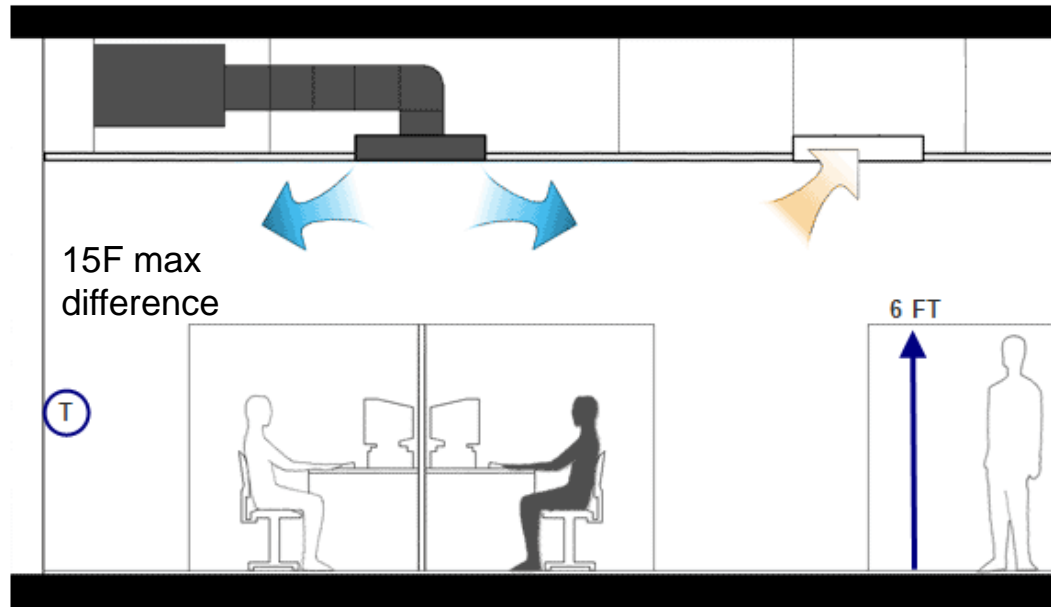
Richard J. Lee

- Used DOAS to control outside air – normally largest cooling load in DFW
- Used Demand-Controlled Ventilation to reduce outside air
- Used Geothermal HVAC to reduce cost of rejecting heat and serve the loads with water instead of air.
 - Do not blow air for long distances (2018 Decentralized systems)
 - AEDG 2018 – Single zone chilled water fan coils, VRF systems, and GSHP
 - What happened to VAV systems?
- You have to use DOAS in the DFW area
- You do not have to use Geothermal

ASHRAE 62.1 VAV rules – Most popular System

1

15F max difference between supply and T stat
100 FPM 4' from floor
Or
20% more OA to supply warm air and return warm air at the ceiling



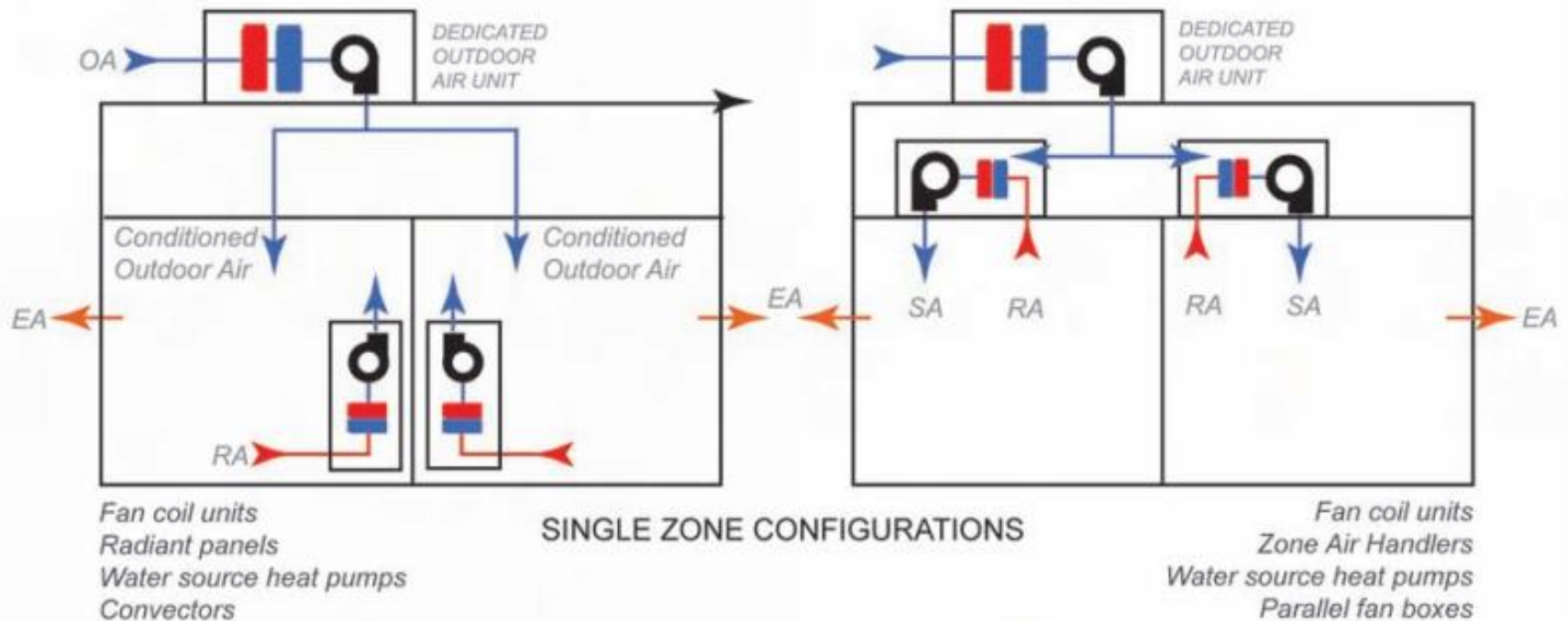
2

% OA supplied to space is set by the space that needs the highest % served by the AHU

3

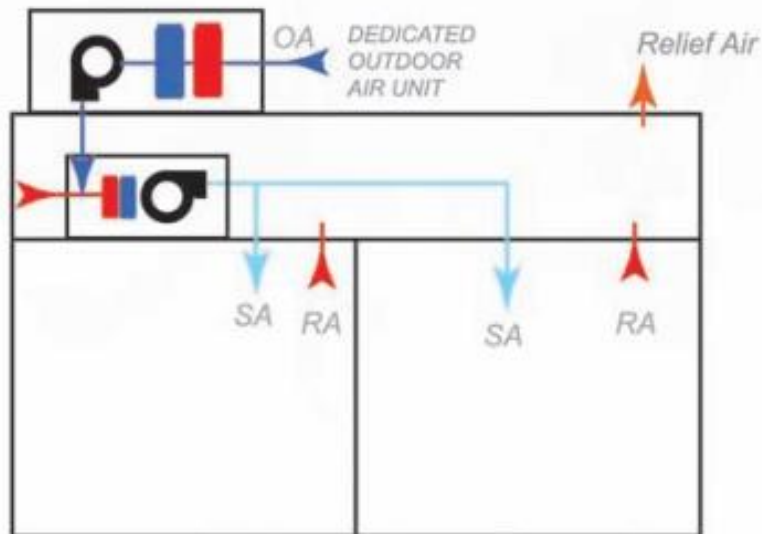
Low sensible load.
Cooling CFM at full load less than 0.5 CFM.
Part load down to 0.2 CFM cooling.
Heating CFM more than the 50% allowed by ASHRAE 90.1
People want to have air movement in the space. Water flow very low.
Series Fan Powered Boxes are needed.

Single Zone DOAS – to the room / to the unit



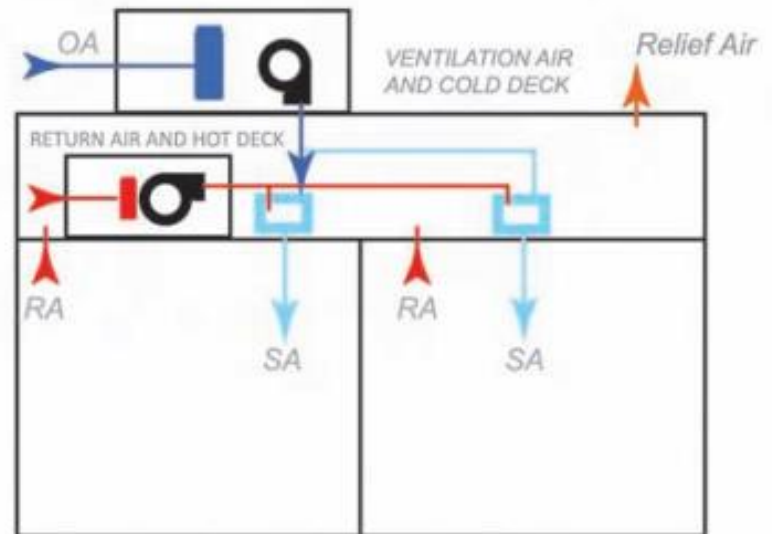
Multiple Zone – to the room / to the unit

ASHRAE 62.1



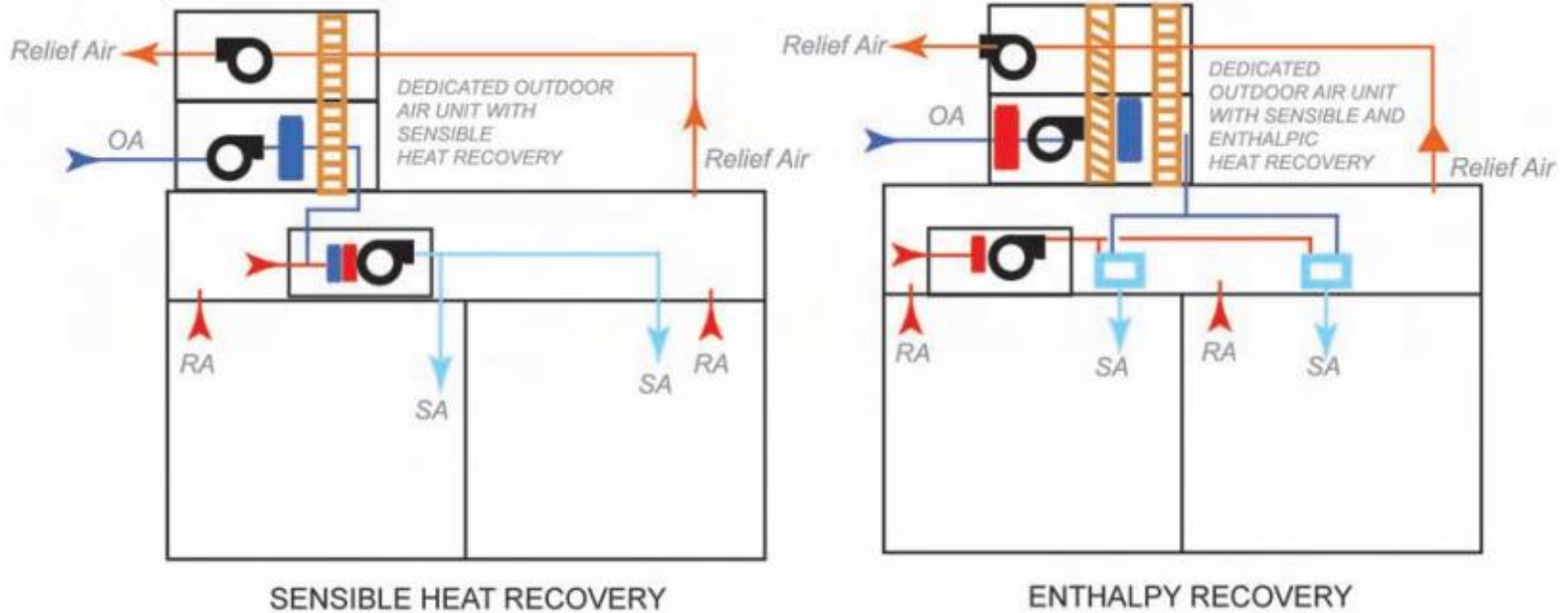
Zone air handlers
Fan powered boxes
Water source heat pumps

MULTIPLE ZONE CONFIGURATIONS
WITH MIXED RETURN

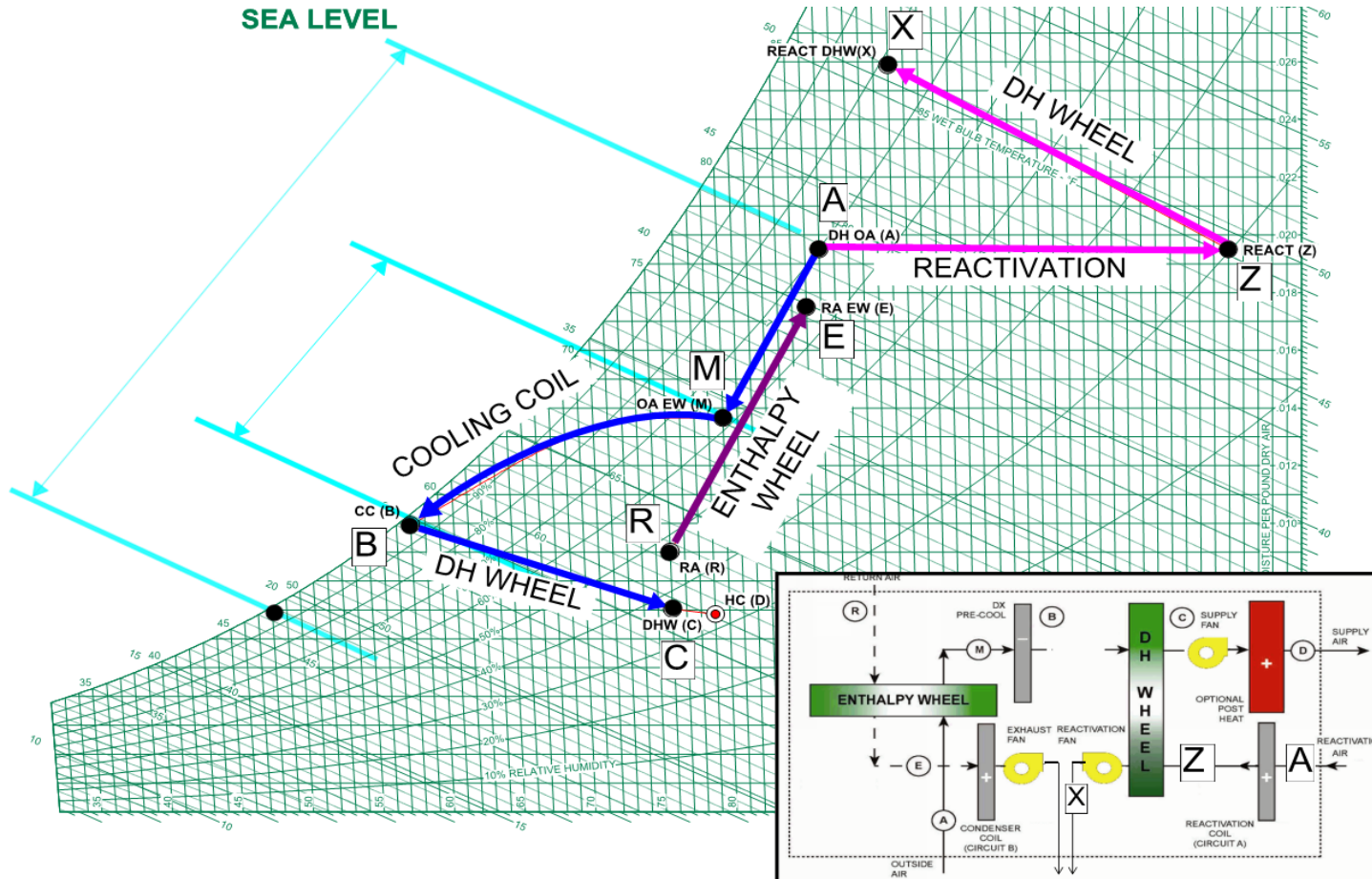


Dual-duct
VAV boxes

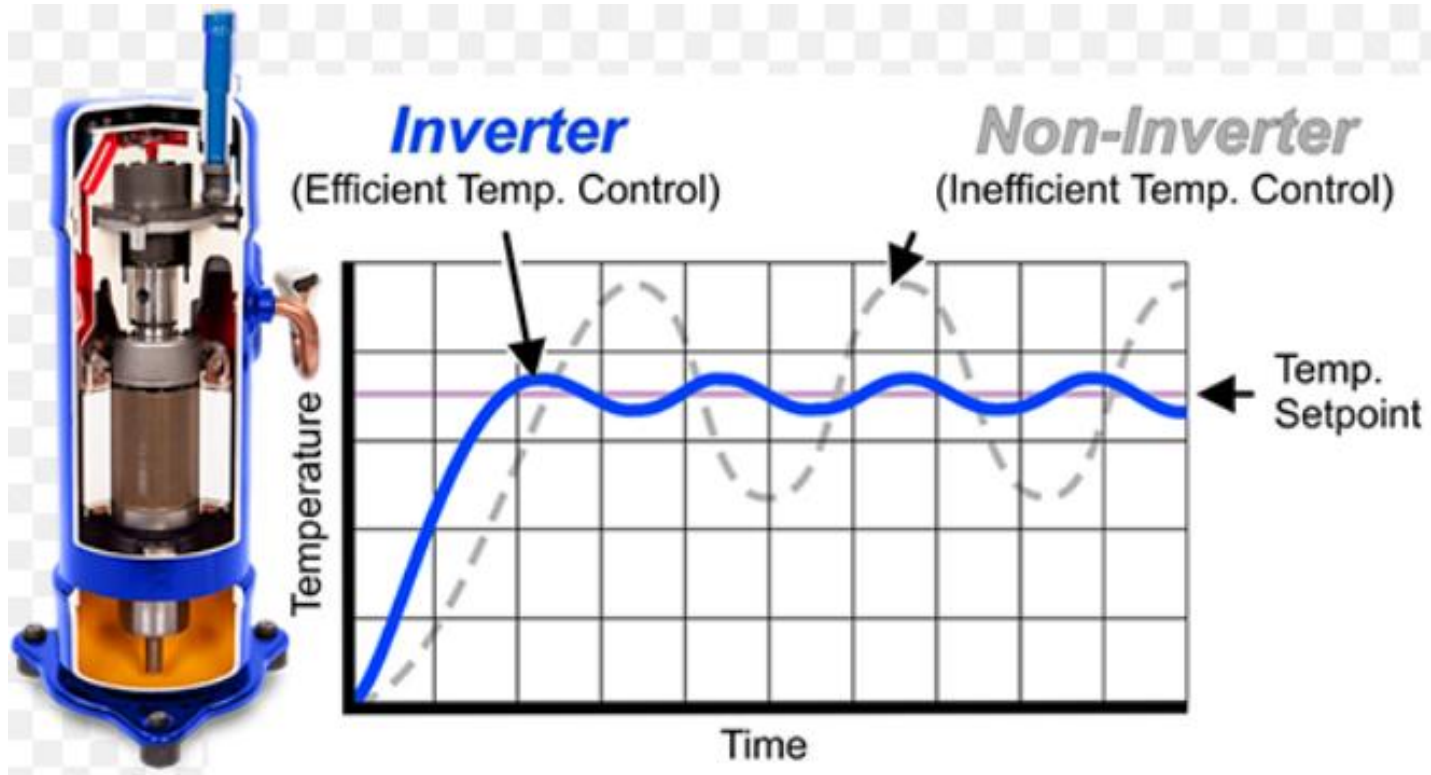
Use Energy Recovery – Everybody Does



Double Wheel DOAS



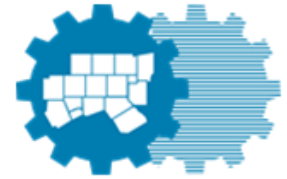
New RTUs – Variable Speed Compressors



Questions



mack@wisewatt.com



**North Central Texas
Council of Governments**

SECO – Basic Utility Bill Analysis

Nov 1, 2018

Presented by:

Carlos Teran, PE
Senior Energy Engineer
Jacobs Engineering Group,
Houston, TX

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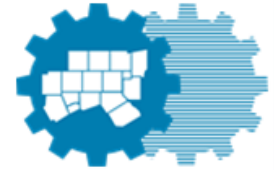
Utility Rate Analysis - Energy Cost Savings



- Typical billing parameters for analysis:
 - Supply
 - Customer Charges
 - Supply Charges (kWh)
 - Time-of-Use (Month, Day, Hour)
 - Consumption Blocks
 - Delivery
 - Transmission & Distribution (kW, kWh)
 - Time-of-Use (Month, Day, Hour)
 - NCP (kW)
 - 4CP (kW)
 - Demand Ratchet (kW)
 - Power Factor (kW)
 - Riders (kW, kWh)
 - Taxes

Utility Rate Analysis - Energy Cost Savings

- Sample Bill



Rate Schedule for TXU/Oncor Tariff SS > 10 kW Non IDR NCP for Electric			
Component	Charge	Unit	Description
Customer Charge:	\$6.80	<i>per month</i>	Base Charge
	\$22.14	<i>per month</i>	Meter Charge
	\$11.59	<i>per month</i>	Energy Efficiency Charge
	\$3.980	<i>per month</i>	Advanced Meter Charge
Consumption Charge	\$0.05974	<i>per kWh</i>	REP charge
	\$0.000654	<i>per kWh</i>	System Benefit Fund
	-\$0.00025	<i>per kWh</i>	RTSPP Settle Charge
Demand Charge	\$4.38000	<i>per Billed KW</i>	Distribution Charge (Annual Load Factor > 26%)
	\$5.01000	<i>per Billed KW</i>	Distribution Charge (Annual Load Factor 21%-25%)
	\$5.16000	<i>per KW</i>	Distribution Charge (Annual Load Factor 16%-20%)
	\$5.47000	<i>per KW</i>	Distribution Charge (Annual Load Factor 11%-15%)
	\$6.10000	<i>per KW</i>	Distribution Charge (Annual Load Factor 0%-10%)
	\$2.22297	<i>per kW</i>	Transmission Cost Recovery Factor
	\$0.17100	<i>per Billed KW</i>	Transition Charge TC1
	\$0.26400	<i>per Billed KW</i>	Transition Charge TC2
	\$0.007521	<i>per Billed KW</i>	Rate Case Surcharge
\$0.04400	<i>per Billed KW</i>	Nuclear Decommission Charge	

Utility Rate Analysis - Energy Cost Savings

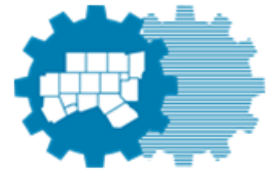
- Time-of-Use



SUMMARY OF BILLING COMPONENTS:

	<u>Summer (Jun-Sep)</u>	<u>Winter (Oct-May)</u>
Customer Charge:	\$1,000.00/month	\$1,000.00/month
Energy Charges:		
Block 1, first 250 KWH/KW:	\$0.0369/KWH	\$0.0369/KWH
Block 2, all remaining KWH:	\$0.0329/KWH	\$0.0329/KWH
Average Fuel Adj. Cost ¹ :	\$0.01104/KWH	\$0.01104/KWH
Average Reg. Adj. Cost ¹ :	\$0.00271/KWH	\$0.00271/KWH
Demand Charges:		
	<u>Summer</u>	<u>Winter</u>
Direct Demand Charge:	\$10.45/KW	\$8.30/KW

Utility Rate Analysis - Energy Cost Savings



- Riders

II. Nuclear Decommissioning Charge:	See Rider NDC	per kWh
III. Transmission Cost Recovery Factor:	See Rider TCRF	
IV. Energy Efficiency Cost Recovery Factor:	See Rider EECRF	
V. Competitive Meter Credit:	See Rider CMC	
Other Charges or Credits		
VI. Rate Case Expense Surcharge:	See Rider RCE	per kWh
VII. Remand Surcharge:	See Rider RS	per kWh
VIII. Capital Structure Refund:	See Rider CSR	per kWh
IX. Distribution Cost Recovery Factor:	See Rider DCRF	per kWh
X. Tax Refund Factor:	See Rider TRF	per kWh

Utility Rate Analysis - Energy Cost Savings

- Power Factor



Meter	Type	Dates	Current Meter Read	Previous Meter Read	Multiplier	kWh Usage	kW Demand	Power Factor
091692353LG	ACT	03/18 - 04/16	5919.03	5798.99	1500	180,039.60	890.00	0.9

Current Charges

	Qty	Rate	Amount
Electric Service			
CKWH : Commercial Energy.....	180,039.60	0.05530	\$9,956.19
HUB-LZ Basis Charge.....	180,039.60	0.00291	\$523.97
TDSP : TDSP Pass-Through Charges.....			\$8,587.00
<i>DIS001:Distribution Charge.....</i>	939.00	5.01000	\$4,704.39
<i>MSC025:Nuclear Decommissioning.....</i>	1,222.00	0.04400	\$53.77
<i>BAS001:Basic Customer Charge.....</i>	1.00	6.80000	\$6.80
<i>TRN002:Firm Point to Point Transmission Service Charge for long term or short term firm.....</i>	845.00	3.77038	\$3,185.97
<i>BAS003:Delivery Point Charge.....</i>	1.00	22.14000	\$22.14
<i>MSC041:Energy Efficiency Cost Recovery Factor (EECRF).....</i>	180,039.00	0.00035	\$63.55
<i>MSC049:Rate Case Expenses Surcharge.....</i>	1,222.00	0.01140	\$13.93
<i>MSC029:Recovery of securitized portion of stranded assets and costs.....</i>	1,222.00	0.17200	\$210.18
<i>MSC036:Recovery of securitized regulatory assets - stranded costs (TC2).....</i>	1,222.00	0.26700	\$326.27
Total Current Charges.....			\$19,067.16

Utility Rate Analysis - Energy Cost Savings

- Unmetered Facilities



MONTHLY RATE

I. Unmetered Facilities

Points of Delivery (POD) Charge: \$57.41 per governmental entity served by the Competitive Retailer.

Lamp	Watts	Lumens	kWh	Schedule			Rectangular*	Post-Top*
				A	R*	C* and D		
Metal Halide	150	14,000	65	\$12.42	N.A.	\$1.43	N.A.	N.A.
	175 (see note 2)	14,000	65	\$12.42	\$18.80	\$1.43	N.A.	N.A.
	250	25,000	100	\$14.26	\$22.29	\$2.13	\$36.62	N.A.
	400	36,000	160	\$14.74	\$23.04	\$3.34	\$36.62	N.A.
	1,000*	110,000	370	\$17.75	\$26.03	\$7.56	\$40.98	N.A.
LED/Low Wattage (See Note 3)	100		40	N.A.	N.A.	\$0.92	N.A.	N.A.

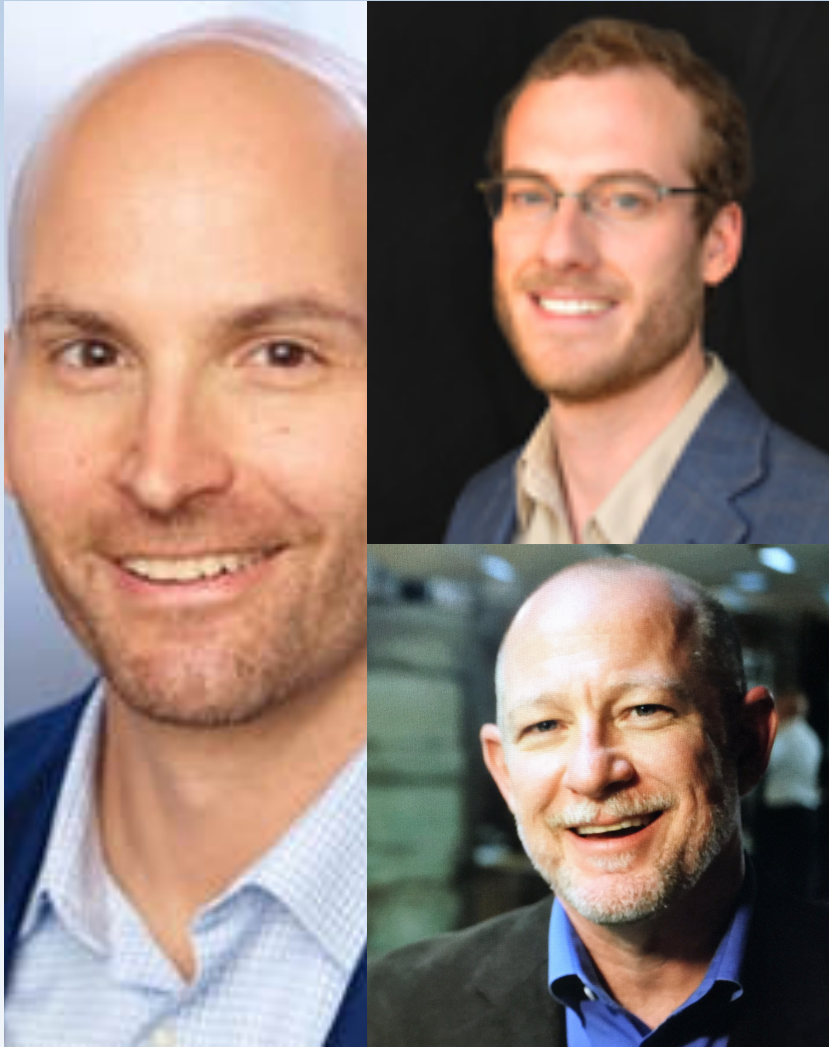
Renewable Energy Planning & Procurement *for Cost Savings and Budget Certainty*

November 1, 2018

**Presented at North Central Texas Council of Governments
Arlington, Texas**



**North Central Texas
Council of Governments**



Speaker Introductions

TJ Ermoian – TEA President & Founder

Mike Bendewald – TEA Chief Operating Officer

Dan Seif – Principal, Seif Consulting



Disclaimers & Disclosures

- 1. The North Central Texas Council of Governments does not endorse or recommend any energy provider, pool or purchasing method, and the material presented here today is for educational purposes.*
- 2. Texas Energy Aggregation (TEA) is providing this information today at our own expense.*
- 3. TEA is compensated by energy providers chosen through an RFP process meeting State purchasing standards. Compensation method for any service provided is listed on the Comptroller's TXSmartBuy web site.*
- 4. TEA is only compensated if we are successful in helping a client obtain an energy agreement.*
- 5. If you have interest in utilizing any of TEA's services, we would be happy to discuss further specifics with you at another date.*

Questions?

Meeting intention and objectives

Intention: Provide NCTCOG members knowledge of opportunities to reduce cost and create long-term budget certainty through renewable energy purchasing agreements.

Objectives:

1. To understand the fundamental economics of how renewables save energy cost and create budget certainty
2. To be able to summarize and simplify the contracting options and process of procurement
3. To increase collaboration among peers and trust in the process
4. To identify common goals for aggregation potential

Tell us about yourself



- **Your name, title and organization**
- **What you hope to get out of today's workshop**
- **Current electricity purchasing method (if you know or would like to share)**
 - Run your own RFP
 - State program (Comptroller or GLO)
 - Interlocal agreement (such as TASB, TIPS, TCAP)
 - Other method?

State Contract Design and Organization



Texas Comptroller, Statewide Procurement Division designs and releases RFP in 2017 for **Electricity Sourcing Services** interlocal purchasing contract



The **State Energy Conservation Office** is chosen to oversee this contract and the RFP process

Any State agency, municipality, school district, college or university may use this contract through the TXSmartBuy portal

2018 - State approval of **Texas Power Pool** through **Electricity Sourcing Services** contract terms



Non-profit **Rocky Mountain Institute** is included as renewables consultant



2017 **Texas Energy Aggregation** wins RFP as selected aggregator/facilitator/consultant





Facilitated by
the Texas Comptroller's
Statewide Procurement Division

Purpose: To provide a simplified method for public entities to:

- Participate in renewable energy buys
- Achieve the lowest historical fixed energy rates
- Ensure adherence to safe, legal State purchasing guidelines
- Access to other comprehensive services in a simplified, unified contract, including:
 - Demand Response programs (voluntary load shedding or dispatch of backup generation assets) for additional revenue/cost reductions
 - On-site solar to reduce regulated delivery costs
 - Includes regulated areas

Ground Rules

- Be present
- Confidentiality
- Step forward, step backward

Today's agenda

[2:00–2:20] Welcome

[2:20–2:55] State of the market

[2:55–3:10] Experiences*

[3:10–3:25] Break

[3:25–4:00] Options for procurement

[4:00–4:30] Action planning*

* Includes small group discussion

Today's agenda

[2:00–2:20] Welcome

[2:20–2:55] State of the market

[2:55–3:10] Experiences*



[3:10–3:25] Break

[3:25–4:00] Options for procurement

[4:00–4:30] Action planning*

* Includes small group discussion

Two types of renewables: utility scale and distributed

	<u>Description</u>	<u>Recent Trends</u>
	<ul style="list-style-type: none">• Greater than 10MW; most often 50+MW• Solar and wind farms• Often located in west and north Texas	<ul style="list-style-type: none">• Corporates are driving demand, largely in Texas• Long-term renewable contracts beat the market price• Aggregations forming to achieve better pricing
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Two types of renewables: utility scale and distributed

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Recent Trends

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- Solar and wind farms
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- Corporates are driving demand, largely in Texas
- Long-term renewable contracts beat the market price
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Distributed Scale

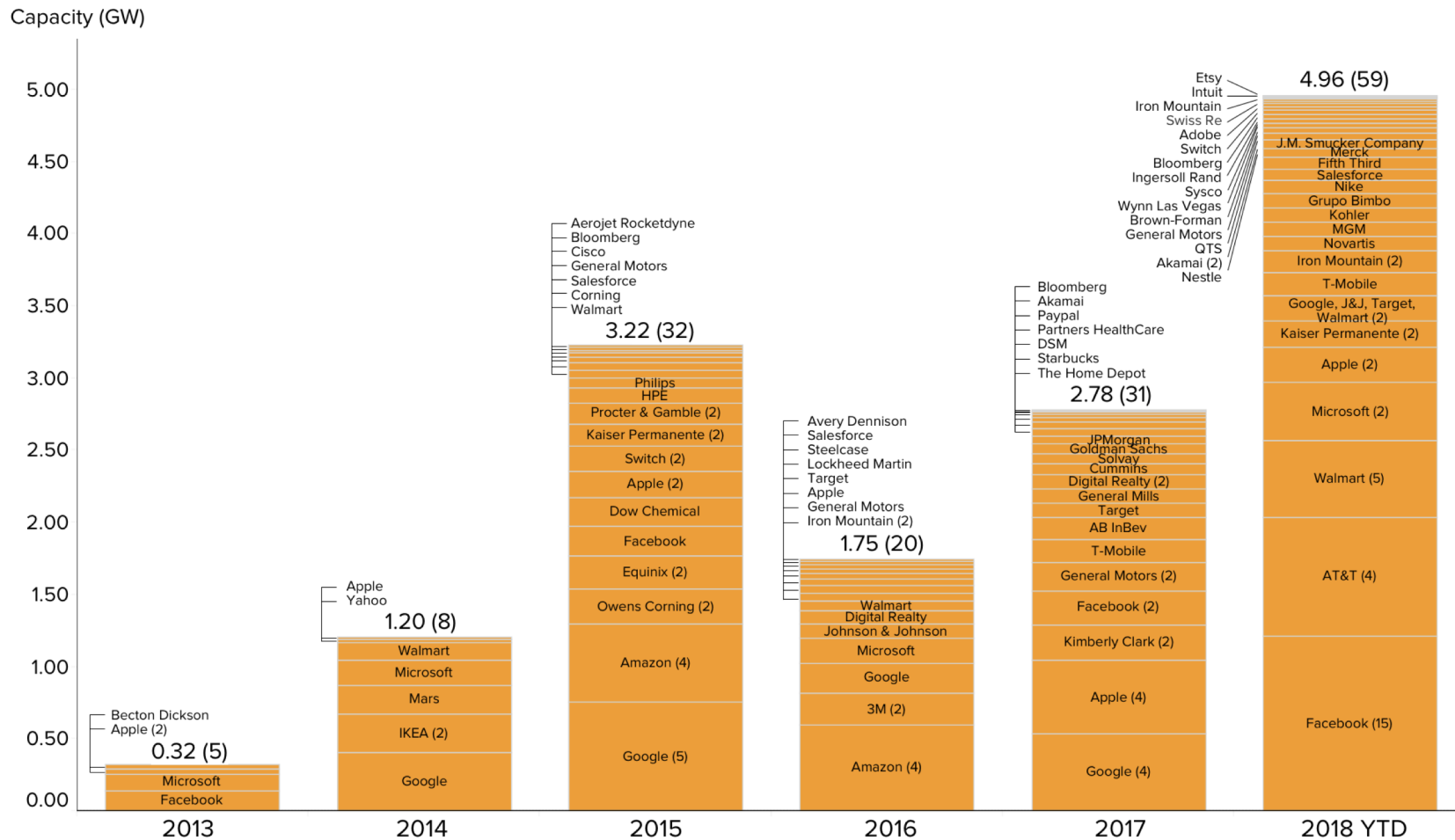
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Corporates are driving much of the demand for utility-scale power purchase agreements

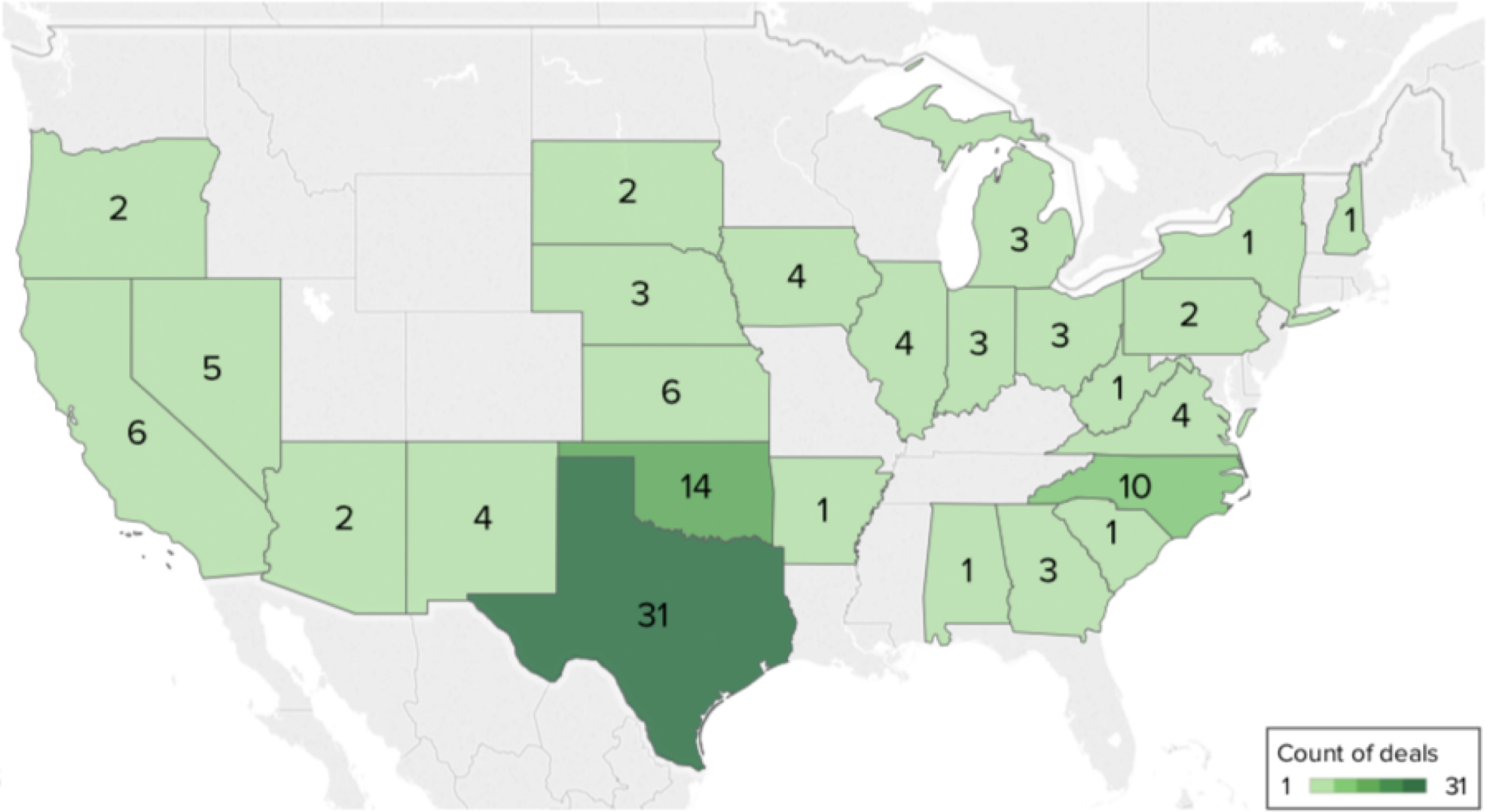


Corporate Renewable Deals 2013 – 2018 YTD



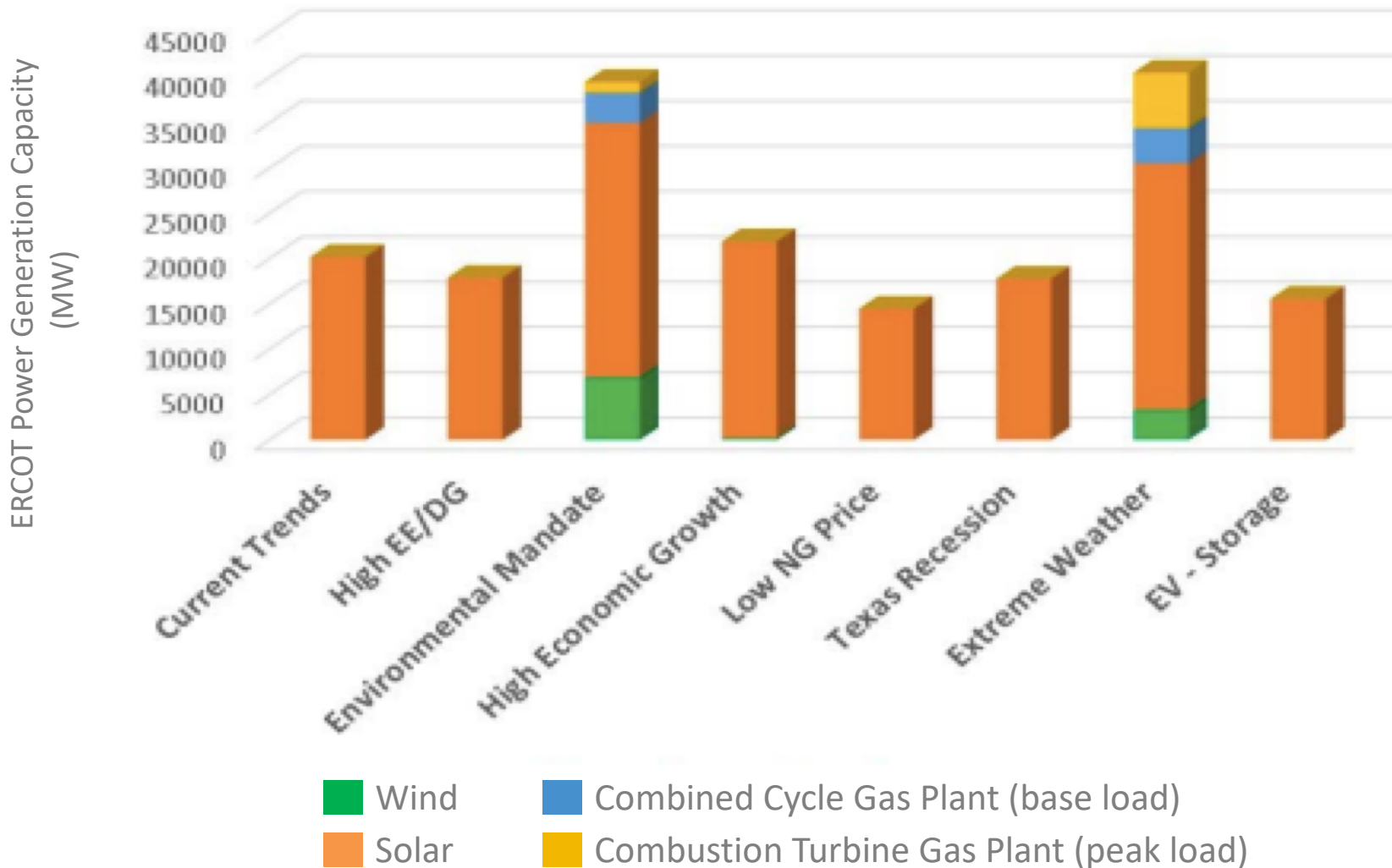
As of October 17, 2018. Publicly announced contracted capacity of corporate Power Purchase Agreements, Green Power Purchases, Green Tariffs, and Outright Project Ownership in the US, 2013 – 2018 YTD. Excludes on-site generation (e.g., rooftop solar PV) and deals with operating plants. (#) indicates number of deals each year by individual companies. Copyright 2018 by Rocky Mountain Institute

Most deals are getting done in Texas



Source: Business Renewables Center

ERCOT's outlook on new-build generation concludes solar is most cost effective the next 20 years



Source: Long term assessment for the ERCOT region,
http://www.ercot.com/content/wcm/lists/89476/2016_Long_Term_System_Assessment_for_the_ERCOT_Region.pdf

City of Houston — off-site solar generation

Description

- “SolaireHolman” 50 MW solar array
- PPA executed in 2016, online in 2017
- 20 year contract
- Meets 10.5% of Houston’s municipally owned load



Lessons

- Long-term (>15 years) necessary for cost savings
- Node for this project has been poorly priced
- Cost savings are somewhat difficult to track
- May be possible to increase project sizes if more power demand viable

203,840 panels, assembled by 148 workers, power....

Benefits

- ~\$2m/yr average savings over term
- Budget certainty for 10.5% of energy-portion of power bill
- #1 US EPA ranking for local government green power users
- #7 ranking by US EPA for overall green power users



Zoo

Bob Lanier
Public Works Bldg.

IAH Terminals

WWT Plants

“As the nation’s largest municipal purchaser of green power, we are living proof that large, industrial cities like Houston can have a robust economy but also help fight climate change”

- Houston Mayor Sylvester Turner

University aggregation case study

Description

- Aggregation of George Washington University (GW), American University (AU) and the George Washington University Hospital (GWUH)
- 53.5 MW of solar

Lessons

- Signed a 20-year power purchase agreement
- ~50% of power consumption is met by solar, remainder is market power

Benefits

- Reach carbon reduction goal
- Economic savings over time

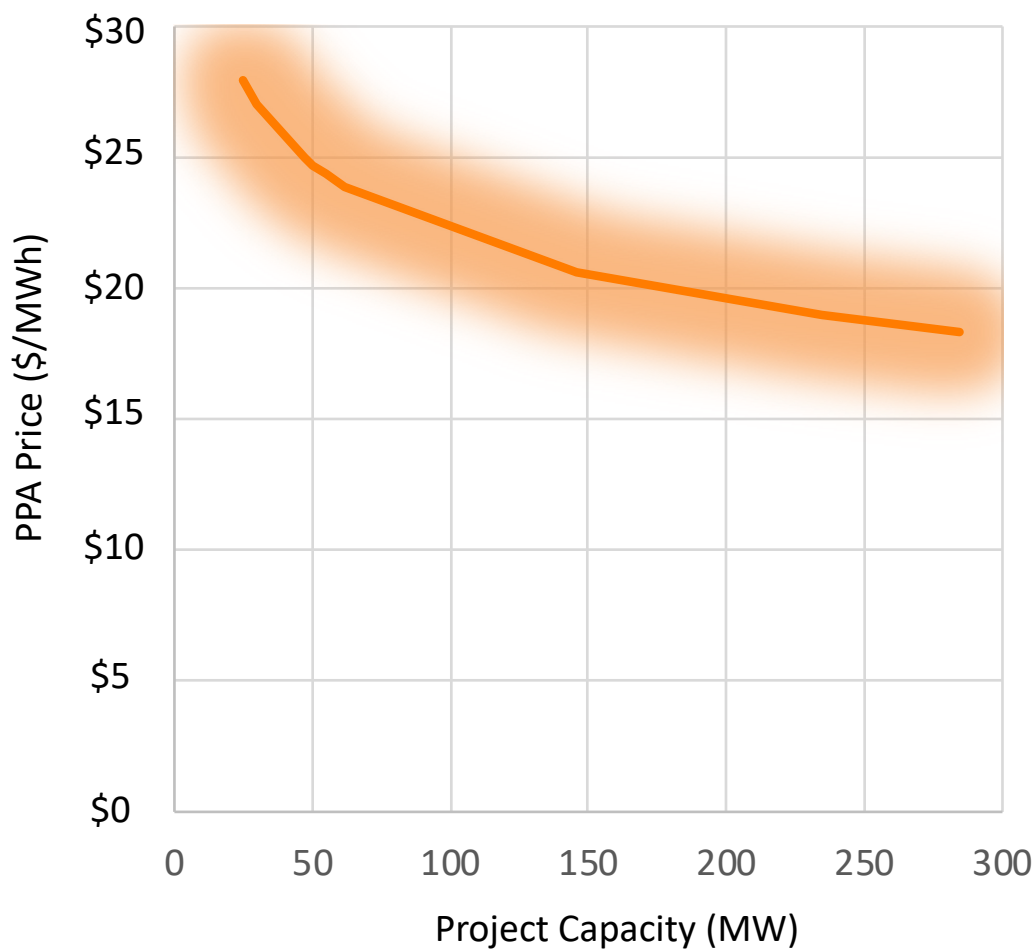


“It really is a model for what universities and other institutions can do together to build capacity for alternative energy.”

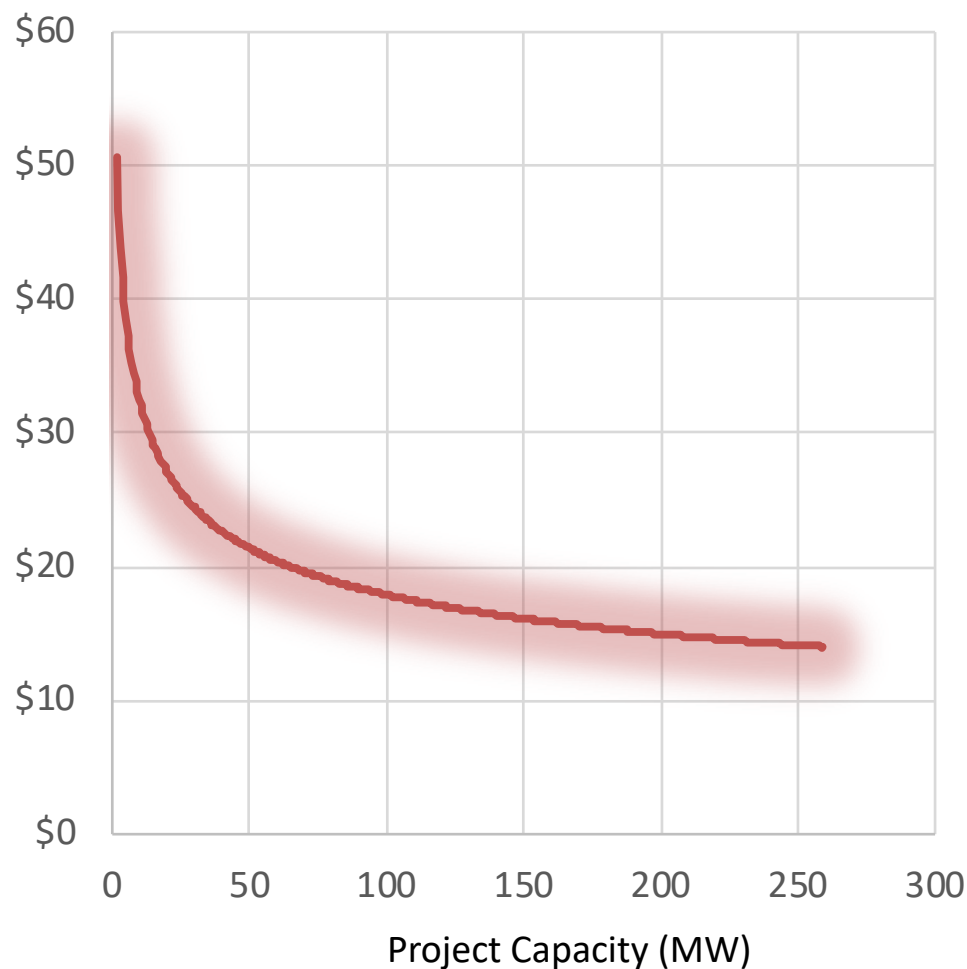
— Steven Knapp, GW President, during remarks to celebrate the one-year anniversary of the project completion

PPA price variability: Bigger projects offer lower pricing

Solar PPA Price vs Project Capacity



Wind PPA Price vs Project Capacity



Data source: Lawrence Berkeley National Lab; data does not distinguish between hub and zone settlement; assume +/- \$4/MWh margin of error

Move quickly or wait?

Current Status

- Solar and wind PPAs at all time low pricing
- Imposition of panel trade tariffs in early 2018 have caused solar PPA pricing plateau, but not increase
- Presumption that wind and solar PPAs only get cheaper is not accurate – Wind PPAs got *more expensive* for 6 consecutive years (2003–2009)
- Immediate savings available

Risks of Waiting

- Elimination-or-reduction of TX Section 313 property tax abatements by Comptroller
- Increases in solar/wind (and related materials like steel) tariffs
- Increase in power market futures prices (projects will then sell at market *and not* cost)—market prices currently near *record lows*
- Tax credits are coming to an end—last opportunity is 2020 for wind and 2020–2023 for solar (steps down over 3 years from 30% to 10%)

Two types of renewables: utility scale and distributed

Description

Recent Trends

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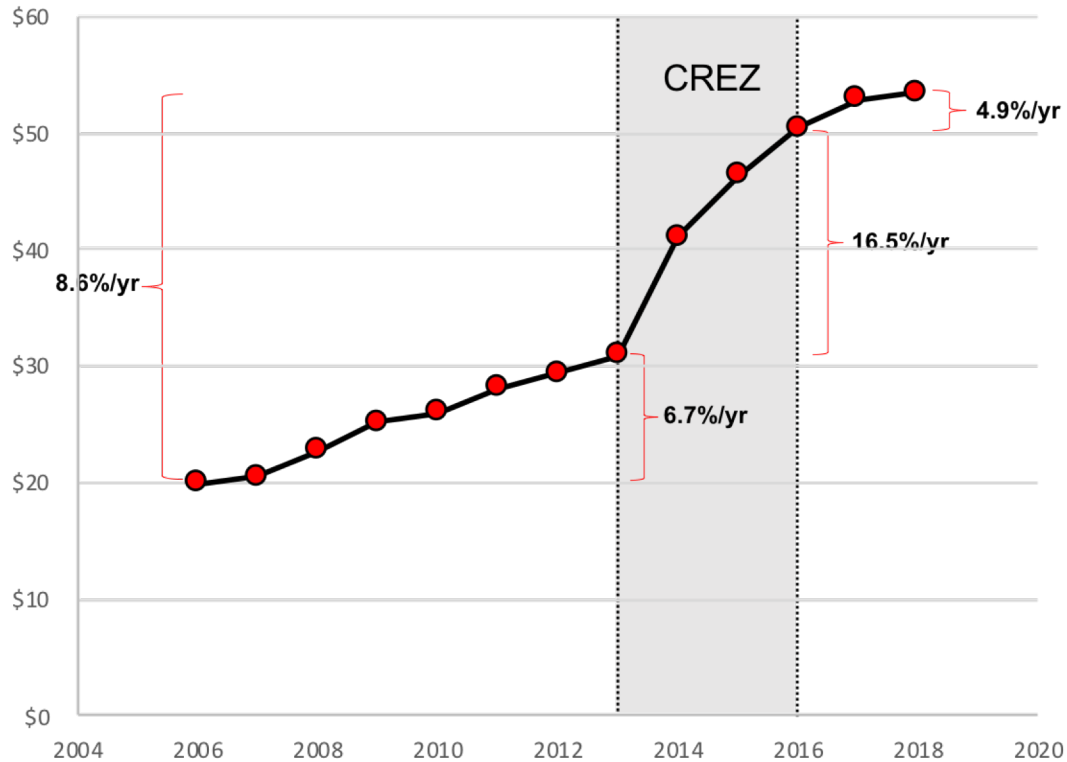
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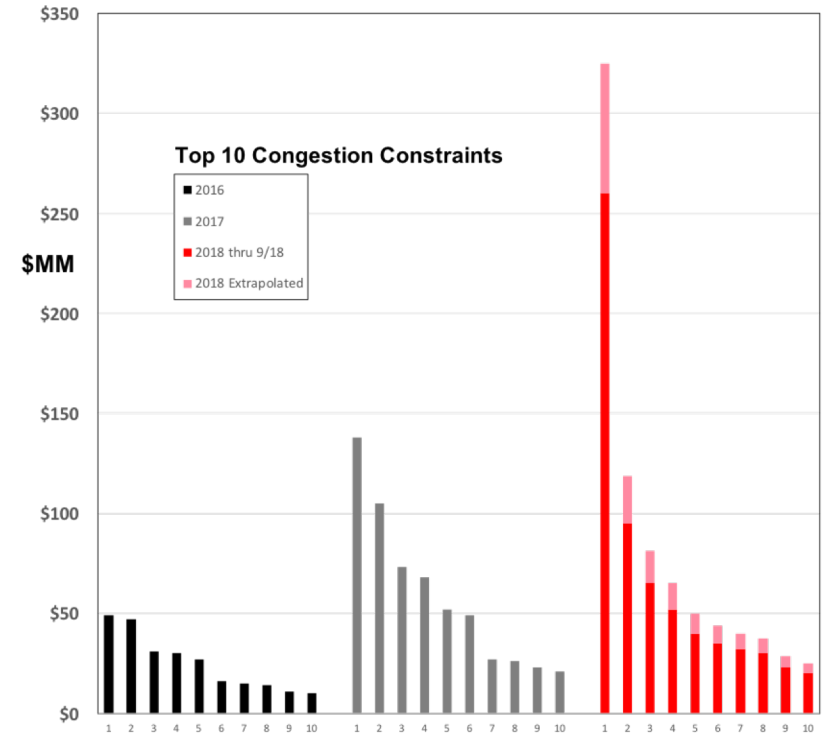
ERCOT Transmission Charge Escalation

ERCOT 4CP Transmission Demand Charge (\$/kW-yr)



Source: PUCT

Worsening Congestion Drives More Transmission



Source: ERCOT

ERCOT Transmission Charge Escalation

- Oncor transmission charges will closely follow ERCOT “Postage Stamp” Rate
- Slight discount to “Postage Stamp” rate due to cross-subsidization (small commercial and residential paying a little more than their fair share)

ERCOT “Postage Stamp” Rate = \$53.58 / kW-yr = \$4.47 / kW-mth

Sept. ‘18 Average Oncor Transmission Cost Recovery Factor (“TCRF”) = \$47.48 / kW-yr = \$3.96 / kW-mth

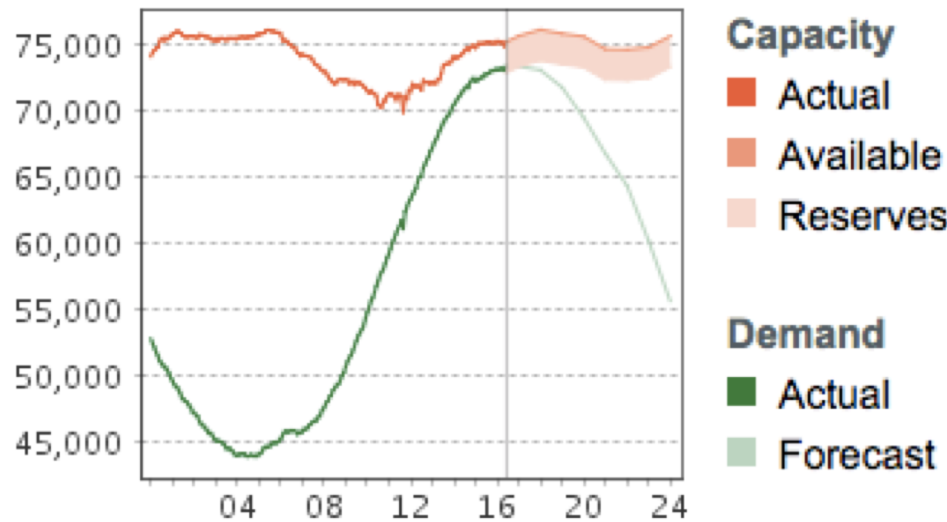
Oncor - Docket 48408		
Class	Charges	
Secondary > 10 kW IDR	per 4CP kW	\$4.566693
Primary > 10 kW IDR	per 4CP kW	\$4.107310
Primary > 10 kW Substation	per 4CP kW	\$3.148377
Transmission IDR	per 4CP kW	\$4.006269

On-site solar reduces transmission charges

Every 4CP moment has occurred between 3:45 and 5pm...

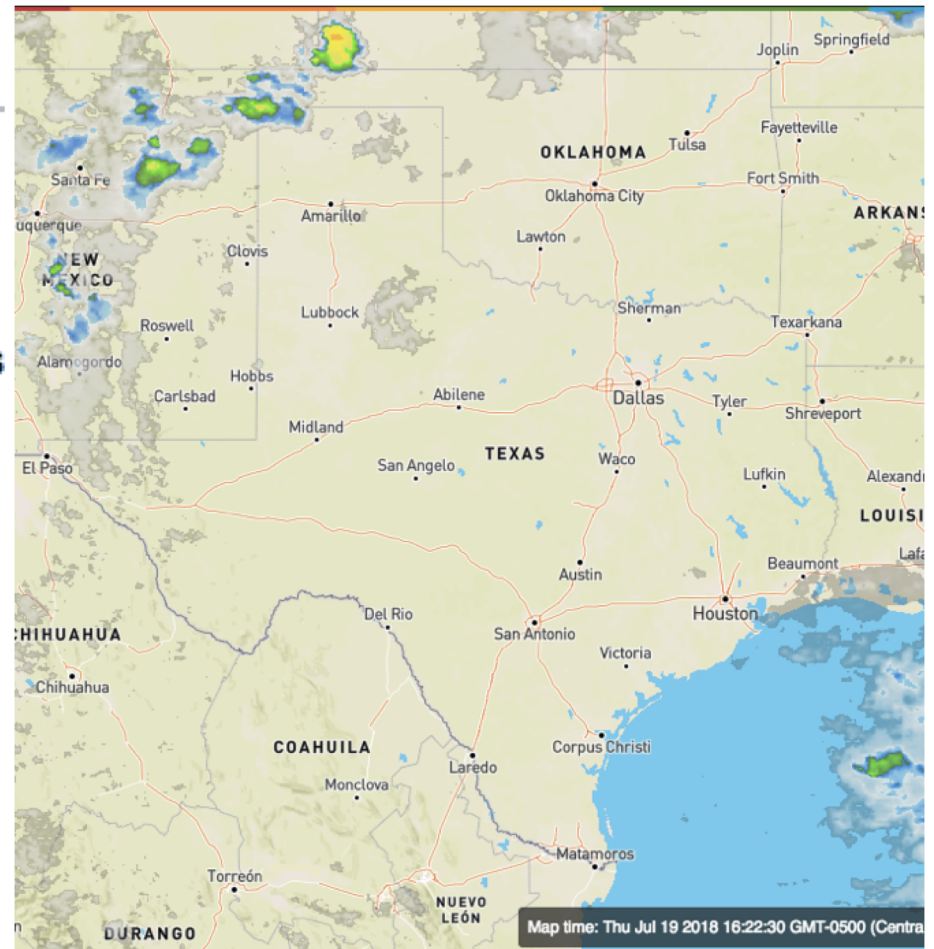
...No need to enroll in 4CP predictive services because the sun is shining >90% of time

TODAY'S OUTLOOK

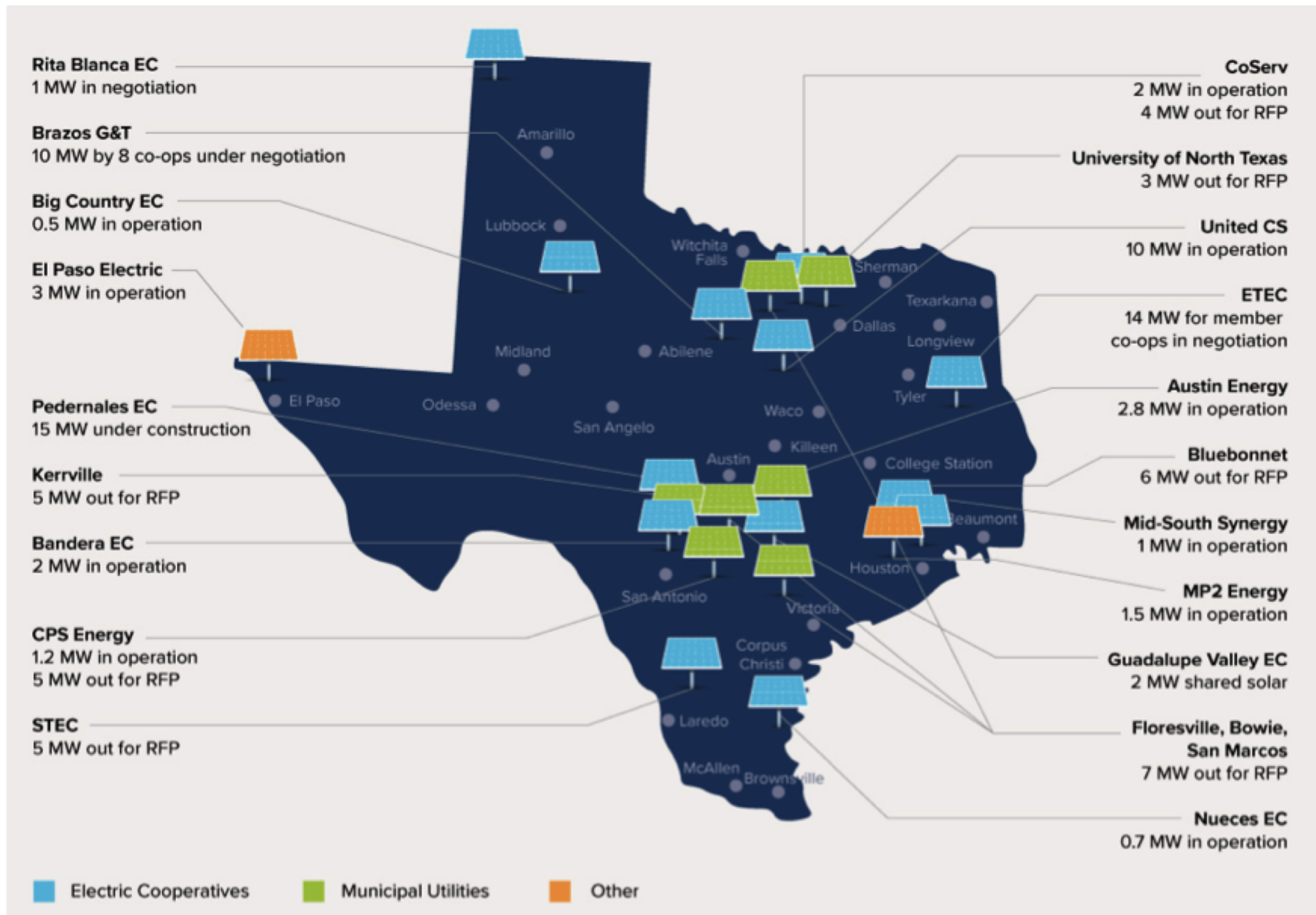


Current Demand: 73,360 MW

Last Updated: Jul 19, 2018 - 16:24



Co-ops and muni's are racing ahead with solar



Source: Rocky Mountain Institute, <https://www.greenbiz.com/article/why-distributed-solar-winning-texas>

City of Kerrville — utility-customer solar generation agreement

Description

- Local non-profits host solar arrays for municipal utility, KPUB
- Projects are front-of-the-meter (on distribution grid)
- Sized at 0.99 MW to capture transmission savings
- Hosts receive discounted power rates
- Remaining power provides lower rates to low income housing.
- KPUB developed tariff structure, determined hosting finalists, and awarded solar projects in 2018

Lessons

- Took a substantial time and internal resources for KPUB to find non-profit hosts and the solar provider
- Utility-scale renewables procurement is a lower resource burden for KPUB

Benefits

- Provides savings to KPUB via transmission (4CP) and energy cost savings – savings passed on to hosts and low-income housing
- Property tax payments of power projects stays within community



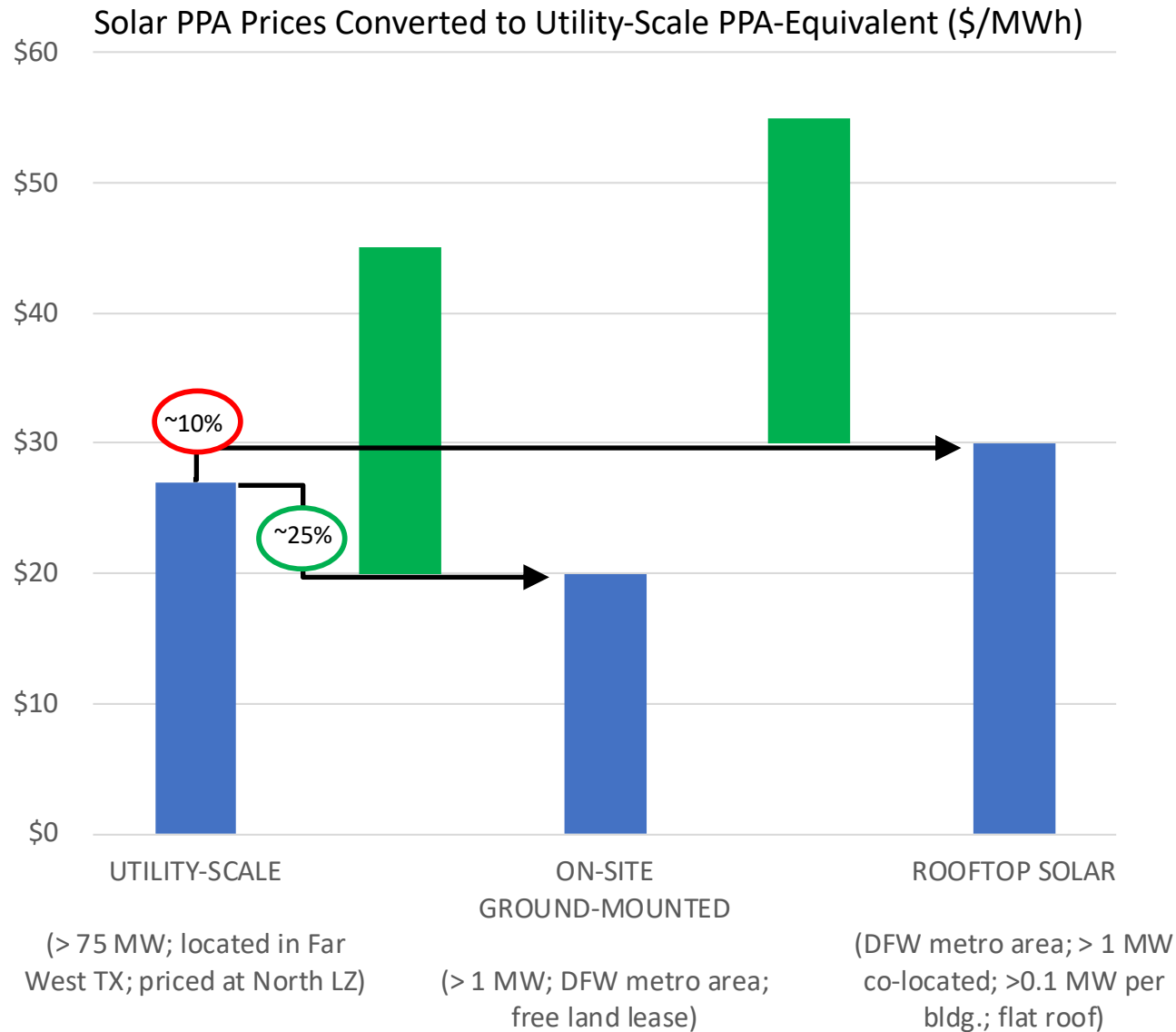
‘Solar Partners’ chosen for two local panel sites

Mike Wittler, general manager of Kerrville Public Utility Board, explained the planned north-south orientation of solar panels to be erected on this acreage on Schreiner University's Weston Farm between East Main Street and Singing Wind Drive. The SU property is one of two leases set for the project.

Source: Hill Country Community Journal

Comparing utility- and distributed-scale solar

UTILITY SCALE versus DISTRIBUTED SCALE



Today's agenda

[2:00–2:20] Welcome

[2:20–2:55] State of the market

[2:55–3:10] Experiences*

[3:10–3:25] Break

[3:25–4:00] Options for procurement

[4:00–4:30] Action planning*

* Includes small group discussion

Experiences

2:55–3:10

1. Form small groups
2. Share your experiences with renewables (10 min)
 - a) Have you considered renewables? Why or why not?
 - b) How did the renewable energy offers perform?
3. Sharing in the plenary (5 min)
 - a) Volunteers share their discussions/insights

Framework: How do the renewables energy offers perform?

Performance Indicator	Performance 1 = very weak 5 = very strong
Contracting simplicity	
Competitively bid on supplier qualifications	
Competitively bid on price	
Budget certainty	
Length of contract	
Cost savings	
Ability to track savings	
Additionality (sustainability)	
Scale (% of your consumption)	

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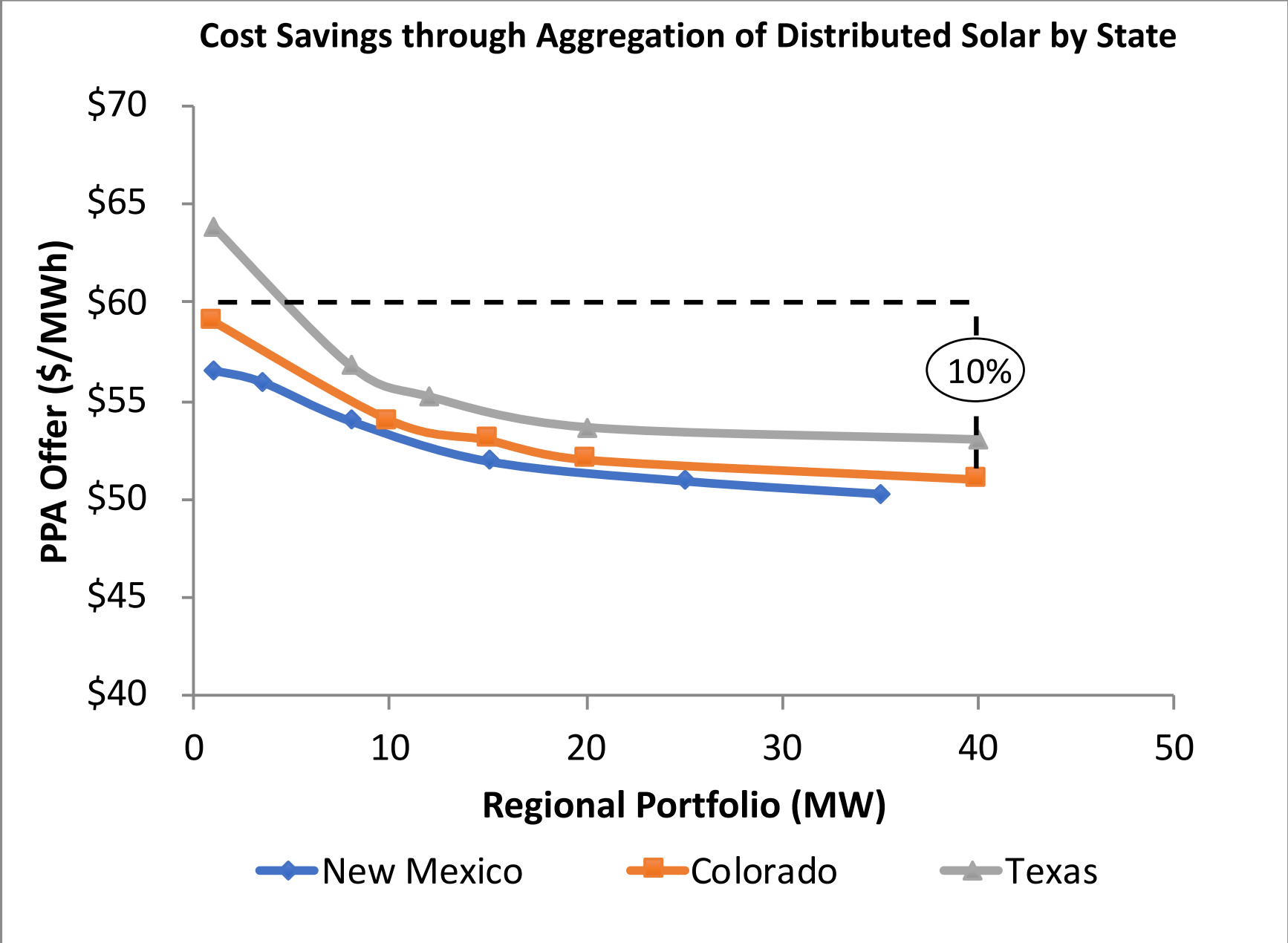
Framework: Rate your priorities

Performance Indicator	How important? 1 = not important 5 = very important
Contracting simplicity	
Competitively bid on supplier qualifications	
Competitively bid on price	
Budget certainty	
Length of contract	
Cost savings	
Ability to track savings	
Additionality (sustainability)	
Scale (% of your consumption)	

Distributed Solar: Options for Procurement

	<u>Description</u>	<u>Assessment</u>
1. Self-procurement	<ul style="list-style-type: none">• Release RFP• Evaluate bids and select a provider	<ul style="list-style-type: none">• Highly customized• Proceed at your own pace• Higher price
2. Muni or Co-op	<ul style="list-style-type: none">• Work with local utility to procure the solar• Bilateral contract/tariff	<ul style="list-style-type: none">• Enables transmission cost savings for better economics• Can be part of an aggregation• Muni or co-op can be challenging to work with
3. Aggregation	<ul style="list-style-type: none">• Multiple entities release RFP together• Individual contracts	<ul style="list-style-type: none">• Can reduce cost by ~10% in relation to self-procurement• Additional buyers can complicate the procurement

Aggregation of distributed solar saves 10% on PPA price



Utility-scale Renewables: Options for Procurement

Description

1. Retail Electricity Provider

- Contract for “100% renewable” power
- Fixed price, matches load
- 2–10 year term

2. Power Purchase Agreement

- Agreement with renewable project developer
- Variable volume, fixed price
- 15–20 year term

3. Public Power Blocks

- Subscription to an aggregated power purchase
- Fixed price block
- 15–20 year term

RECS = Renewable Energy Certificates

Public Power Block is the biggest public entity renewables aggregation, offering low prices and budget certainty



What it is

- A 150+ MW block of power composed of new-build solar, new-build wind, and grid power (natural gas, coal, nuclear, and existing renewables)
- 15–20 year term, beginning mid-2020
- To be competitively bid on price and qualifications for the Texas Power Pool early 2019

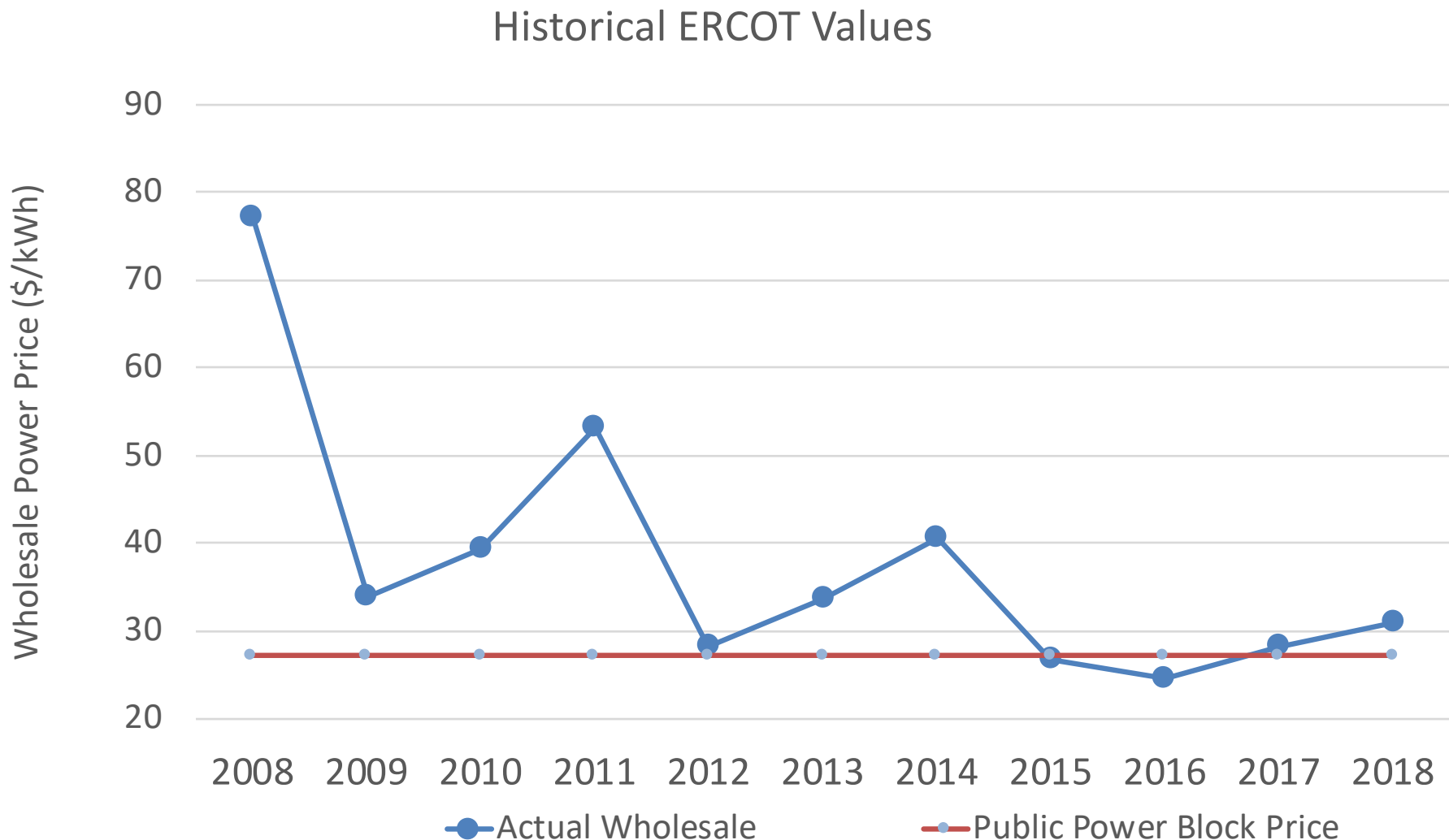
Why it matters

- Immediate cost savings
- Reduced exposure to electricity market volatility
- Integrates with existing and future retail electricity provider contracts
- Enables 150–200 MW of new-build solar and/or wind
- Creates revenue for Texas university systems

Target Customers

- State of Texas entities or AA-rated-or-higher Texas municipal entities, ISDs and universities
- Minimum 20 million kWh annual power consumption

The Public Power Block (PPB) enables public entities to lock in historic low *temporary* pricing, but now for 15–20 years



Source: Actual wholesale values are historical load zone settlement prices taken from ERCOT State of the Market reports.

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Action Planning

4:00–4:25

1. Form small groups
2. How can you overcome renewable energy procurement challenges? (5 min)
 - a) What are your procurement challenges?
 - b) What does success look like?
3. What are the most important steps to take? (10 min)
 - a) What do you need to accomplish?
 - b) Who should be involved?
 - c) How will you know when you are making progress?
4. Sharing in the plenary (10 min)
 - a) Volunteers share their discussions/insights

Concluding messages

- Texas Power Pool is a power purchasing option made available through the Comptroller Statewide Procurement Division
- Renewable energy is the lowest cost power in Texas if procured long-term
- No need to wait for your retail power contract to expire
- Renewable energy provides long term hedge against future prices
- Savings vs long-term market prices are not guaranteed, but most deals are done based on high probability

THANK YOU

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