



# **CELCC** Community Efficiency Leadership Coalition



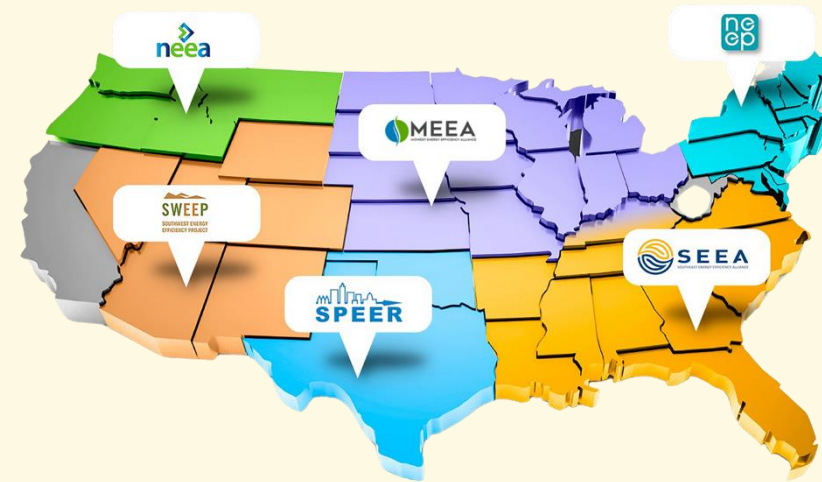
**Webinar Series**





# Who is SPEER?

- **REEO: Regional Energy Efficiency Organization**
- **Member-based, non-profit 501(c)3 organization**
- **65+ members from a wide cross section of Energy Efficiency Industries**
- **Focused on Outreach Education and Collaboration on Clean Energy**





# HOUSEKEEPING



- Questions are welcome in the chat or Q & A
- Presentations will be posted on the SPEER YouTube Channel
- All ICC CEUs will be emailed out within three days



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## Utility-Sponsored Energy Efficiency Programs in Texas



**PRESENTER:**  
**HARIS A.Y. KHAN**  
SUSTAINABILITY ANALYST,  
ENVIRONMENTAL SERVICES  
CITY OF FRISCO

**WEBINAR:**

*FROM UTILITY BILLING TO INSIGHTS:  
ELECTRICITY MONITORING AND  
ENERGY CONSERVATION AT  
MUNICIPAL FACILITIES*



**MAY 14TH**





SPEER CELC Monthly Webinar

# Streamlining Energy Reporting & Analysis for Public Infrastructure

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**City of Frisco, Texas**

Haris A. Y. Khan | Sustainability Analyst

May 2026

# Public Building Requirements



## Texas Health & Safety Code §388.005(c)

Political subdivisions in 41 non-attainment or affected counties must establish a goal to reduce electricity consumption by **at least 5% each calendar year**.

In 2019, the 86th Legislature passed Senate Bill 241, extending this timeline seven years beginning September 1, 2019.

Each political subdivision must submit an annual report to SECO on progress and efforts toward the 5% reduction goal.

[comptroller.texas.gov](http://comptroller.texas.gov)

## DFW Region

Non-attainment for  
ground-level ozone



### Annual SECO Report

Required for all political subdivisions in  
affected counties

# SECO Reporting

CONTACT INFORMATION	REPORTING PERIOD START DATE	REPORTING PERIOD END DATE	ENTITY NAME	ENTITY TYPE	CITY	COUNTY	NUMBER OF BUILDINGS AND/OR FACILI...	BUILDINGS TOTAL GROSS SQ FOOTAGE	TOTAL BUILDINGS (kWh)
<b>ENERGY USE SUMMARY</b>									
<b>ELECTRICITY USE</b>	01/01/2020	12/31/2020	City of Frisco	Municipality	Frisco	Collin	44	2,026,998	15,429,128
	01/01/2021	12/31/2021	City of Frisco	Municipality	Frisco	Collin	44	2,026,998	14,119,691
	01/01/2022	12/31/2022	City of Frisco	Municipality	Frisco	Collin	44	2,026,998	12,093,987
<b>NATURAL GAS USE</b>	01/01/2023	12/31/2023	City of Frisco	Municipality	Frisco	Collin	42	1,926,525	18,008,067
	01/01/2024	12/31/2024	City of Frisco	Municipality	Frisco	Collin	39	1,472,220	17,141,995
<b>WATER CONSUMPTION</b>									
<b>RENEWABLE ENERGY</b>									
<b>ENERGY REDUCTION GOAL</b>									
<b>SECO RESOURCES</b>									
<b>IMPROVEMENT AREAS</b>									
<b>POLICIES AND TRAINING</b>									
<b>THIRD-PARTY RESOURCES</b>									

TOTAL ELECTRIC CONSUMPTION (kWh)	% Change
43,595,773	
41,390,314	-5.1%
39,031,066	-5.7%
39,520,906	+1.2%
51,600,972	+30.6%

*Potentially different reporting approaches?*

comptroller.texas.gov

## Apples-to-Apples Comparison

*Old Methodology (SECO Reported)*

**-8.5%**

20-21

**-14.3%**

21-22

**+48.9%**

22-23

**-4.8%**

23-24

*Streamlined Pipeline (Y-o-Y from actual kWh)*

**-4.4%**

20→21

**+7.7%**

21→22

**+29.3%**

22→23

**+0.2%**

23→24

**+1.8%**

24→25

# Automating Electricity Data Collection

## Project Goals



Automate, streamline, and standardize electricity data collection for City facilities



Enable accurate annual SECO reporting with consistent methodology



Build a foundation for piloting energy efficiency programs

## Data Pipeline Process

- 1** **Convert & aggregate unstructured data from monthly PDF bills**  
*CoServ & Gexa formats*
- 2** **Text-mine kWh, service type, address, billing period**  
*Pattern-based extraction*
- 3** **Automate data cleaning, filtering, and grouping**  
*Standardized output*
- 4** **Match addresses with facilities (FACs) via map cross-reference**  
*Geospatial validation*
- 5** **Feed into SECO reports & energy monitoring dashboards**  
*Automated refresh*

*\*Text mining refers to identifying patterns in text to extract relevant information.*

# Energy Data Received: CoServ

## Sample CoServ PDF Bill

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⚡ Account Number: 9000275198  
Electric Service Rate: Industrial - Tou - Off Peak Service Address: 4485 COTTON GIN RD FIRE STAT 4

Meter #	From	To	Days	Last Read	Current	Mult.	kWh
399686 Off	05/23/2024	06/25/2024	33	11053	23565	1	12512

Current Charges		
Customer Charge		\$45.00
Off Peak Energy Charge	12,512 kWh	\$1,005.49
PCRf	12,512 kWh @ \$0.005	\$62.56
SCRf	12,512 kWh @ \$0.0054	\$67.56
On Peak Demand	32,249 kW @ \$11.15	\$359.58
NCP Demand	35.00 kW @ \$2.35	\$82.25
Municipal Franchise Fee		\$64.89
<b>Total Current Charges</b>		<b>\$1,687.33</b>

⚡ Account Number: 9000275199  
Electric Service Rate: Commercial-Tou-On Peak kWh Service Address: 2695 PARKWOOD BLVD

Meter #	From	To	Days	Last Read	Current	Mult.	kWh
359220 On	05/23/2024	06/25/2024	33	40576	40659	1	83
359220 Off	05/23/2024	06/25/2024	33	12896	13519	1	623

Current Charges		
Customer Charge		\$27.50
On Peak Energy Charge	83 kWh	\$16.85
Off Peak Energy Charge	623 kWh	\$68.28
PCRf	706 kWh @ \$0.005	\$3.54
SCRf	706 kWh @ \$0.0054	\$3.81
Municipal Franchise Fee		\$4.90
<b>Total Current Charges</b>		<b>\$124.78</b>

⚡ Account Number: 9000275200  
Electric Service Rate: Public - Electric Under 35 kW Service Address: 8001 WOODSTREAM DR

Meter #	From	To	Days	Last Read	Current	Mult.	kWh
698722	05/23/2024	06/25/2024	33	0	0	1	0

Current Charges		
Customer Charge		\$20.00
Municipal Franchise Fee		\$0.80
<b>Total Current Charges</b>		<b>\$20.80</b>

⚡ Account Number: 9000275201  
Electric Service Rate: Commercial-Tou-On Peak kWh Service Address: 12134 CTY RD 22 WATER TANK

Meter #	From	To	Days	Last Read	Current	Mult.	kWh
435254 On	05/23/2024	06/25/2024	33	28042	28277	1	235
435254 Off	05/23/2024	06/25/2024	33	84495	85381	1	886

Current Charges		
Customer Charge		\$27.50
On Peak Energy Charge	235 kWh	\$47.70
Off Peak Energy Charge	886 kWh	\$97.11
PCRf	1,121 kWh @ \$0.005	\$5.61
SCRf	1,121 kWh @ \$0.0054	\$6.05
Municipal Franchise Fee		\$7.36
<b>Total Current Charges</b>		<b>\$191.33</b>

⚡ Account Number: 9000275204  
Electric Service Rate: Lighting - Street Lights Service Address: ELDORADO FAIRWAY@TRAILS B LTS

Meter #	From	To	Days	Last Read	Current	Mult.	kWh
	05/23/2024	06/25/2024	33				

Current Charges		
Coop 153 Watt - 360 kWh	6 @ \$11.76	\$70.56
SL Consumption PCRf	\$0.005	\$1.80
SL Consumption SCRf	\$0.0054	\$1.92
Municipal Franchise Fee		\$3.00
<b>Total Current Charges</b>		<b>\$77.28</b>

## Matched Facilities & Consumption Data

9000275198	4485 COTTON GIN RD FIRE STAT 4	125,268	CoServ	Fire Station 4	11,016
10443720001656900	8860 TOMLIN	120,360	GEXA	Fire Fleet	11,817
9000275090	5449 WARREN PKWY FIRE STAT 3	135,760	CoServ	Fire Station 3	12,717
10443720008000800	3711 OHIO DR DEPT FIRE	94,640	GEXA	Fire Station 2	13,285
9000275328	14300 ELDORADO PKWY	186,120	CoServ	Fire Station 5	13,458
9000275417	3535 ELDORADO PKWY	155,680	CoServ	Fire Station 6	13,559
9000275546	330 STONEBROOK PKWY W FIRE STAT	183,880	CoServ	Fire Station 7	14,659
10443720008624700	6645 PAGE	129,040	GEXA	Heritage Musuem	17,691
9000275636	14700 ROLATER RD FIRE STATION #8	347,760	CoServ	Fire Station 8	19,326
9000275279	11300 RESEARCH RD ADMIN BLDG	1,853,640	CoServ	Public Works Building	59,791
9000275465	8000 DALLAS PKWY N	618,240	CoServ	Discovery Center	50,300
9001463072	8000 DALLAS PKWY N	2,856,180	CoServ	Public Library	157,344
10443720008121000	8601 GARY BURNS DR DEPT FIRE	932,200	GEXA	Central Fire Station	45,152
9000275379	7200 STONEBROOK PKWY POLICE STAT	1,400,080	CoServ	Police Station	101,586
9001773749	7200 STONEBROOK PKWY FRISCO PD AUX BLDG	273,840	CoServ	PD Auxillary Building	19,957
10443720008120100	7200 STONEBROOK PKWY UNIT TOWER	81,211	GEXA	Radio Tower	500
9000275413	5828 NANCY JANE LN	2,685,200	CoServ	Frisko Athletic Center	103,919
9000275367	6101 FRISCO SQUARE BLVD CITY HALL	2,103,120	CoServ	City Hall	148,000

## Results

- ✔ Automated, streamlined, and standardized electricity consumption data collection for all City facilities.
- ✔ Enabled accurate, consistent annual SECO reporting with apples-to-apples methodology.
- ✔ Established an initial framework for piloting energy efficiency programs across the City.

# Energy Dashboarding Pipeline

1

## PDF lands in inbox

Power Automate routes it to a SharePoint folder

2

## Scheduled script triggers

Low-memory task manager runs every 30 minutes

3

## Data extraction & cleaning

Script processes PDF text, extracts kWh and metadata

4

## Excel files updated

Structured output merged with secondary data sources

5

## Dashboard auto-refreshes

Power BI model refreshes daily/monthly

## Other Data Sources



### Building Information

Square footage, occupancy, building type, and facility ID for each address.



### Weather Data (NOAA CDO)

Historical temperature data converted to HDD and CDD inside Power BI's data modeler.



### Utility Rate Information

Rate schedules for cost analysis and budget forecasting.



# Electricity Consumption Overview

Calendar Year

- 2020
- 2021
- 2022
- 2023
- 2024
- 2025
- 2026

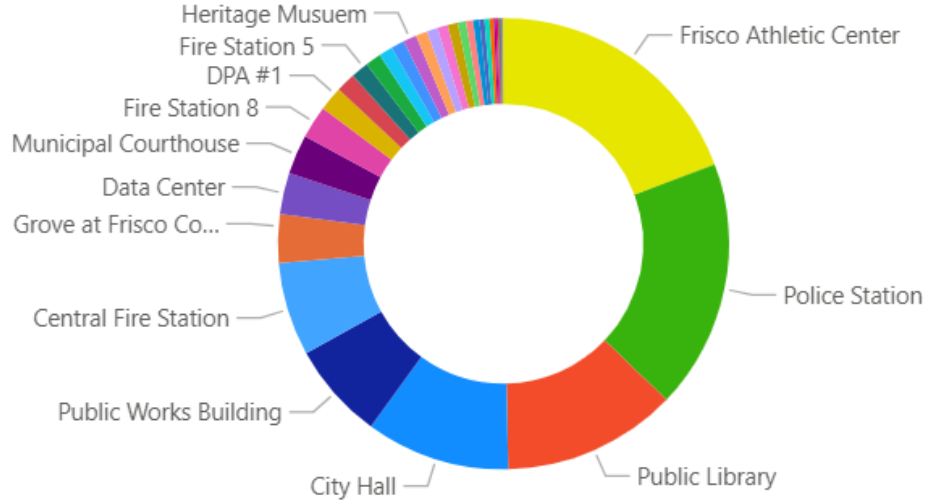
- Usage
- Cost
- Normalized Consumption

Building Name

Utility Provider

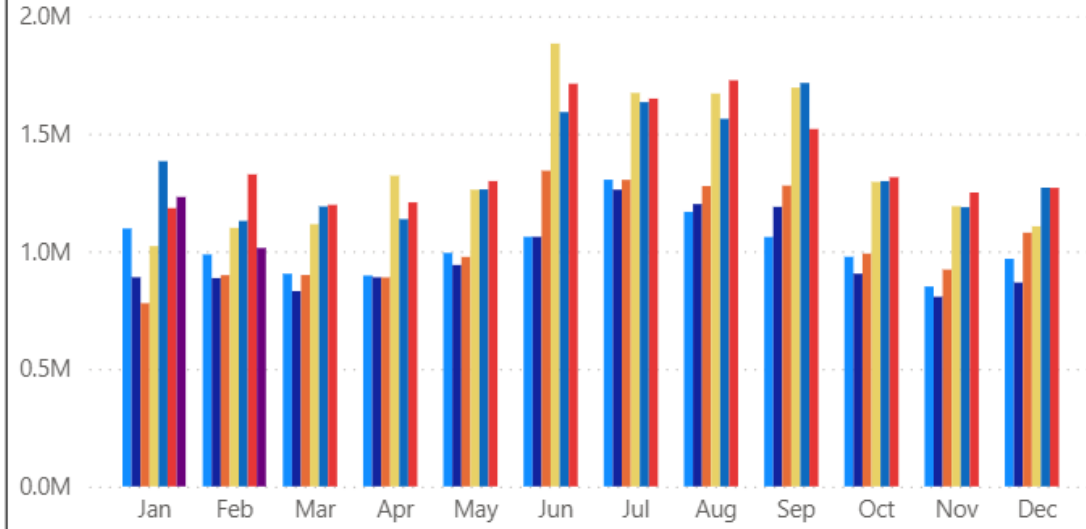
### Electricity Usage by Site (kWh)

Total Buildings: 38

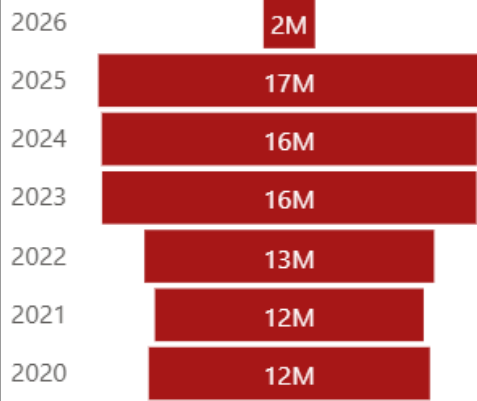


### Electricity Usage by Month and Year (kWh)

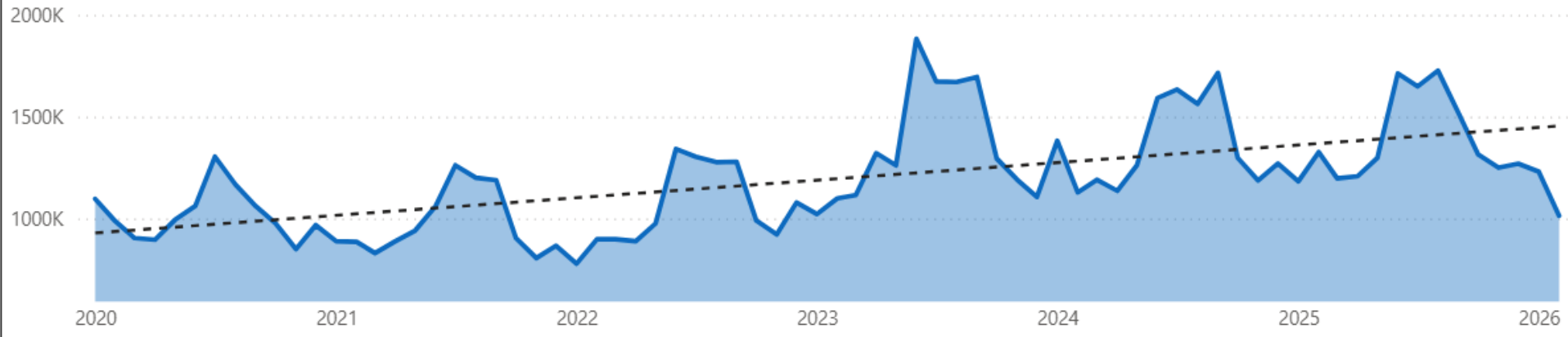
Calendar Year ● 2020 ● 2021 ● 2022 ● 2023 ● 2024 ● 2025 ● 2026



### Electricity Usage by Year (kWh)



### Electricity Usage by Month (kWh)



# Normalizing Data: HDD & CDD



## Heating Degree Days (HDD)

Measures how much (in degrees) and for how long the outdoor temperature falls below a base temperature (typically 65°F), indicating heating demand.

$$\text{HDD} = \max(0, 65^\circ\text{F} - \text{Avg. Daily Temp})$$



## Cooling Degree Days (CDD)

Measures how much (in degrees) and for how long the outdoor temperature rises above the base temperature, indicating cooling demand.

$$\text{CDD} = \max(0, \text{Avg. Daily Temp} - 65^\circ\text{F})$$

## Why HDD/CDD Matter for This Project

- ✓ Weather-normalize energy consumption: separate weather-driven usage from operational changes.
- ✓ Apples-to-apples comparison: a mild winter vs. a harsh one distorts raw kWh year-over-year.
- ✓ Identify inefficiencies: high consumption during low HDD/CDD months signals waste, not weather.
- ✓ Critical for DFW: Texas summers drive massive CDD-correlated cooling loads across City facilities.

# Next Steps & Opportunities

## Energy Efficiency Programs

Quantify the impact of conservation measures:

- Setpoint & thermal comfort policies
- LED retrofits, solar panels, heat pumps
- Automated lighting & HVAC controls
- Utility incentive & rebate programs

## Expanded Monitoring

- Add gas consumption tracking by building
- Flag high-consumption addresses with low occupancy or high Energy Utilization Index (EUI)
- Benchmark facilities against peers using EUI (kBtu/sq ft)

## Sustainability Stipend Positions

Assign dedicated sustainability liaisons at the highest-consuming facilities to own energy targets, monitor trends, and drive behavioral change on-site.

## Renewables & Recognition

Pursue solar feasibility studies for large-footprint facilities. Apply for EPA ENERGY STAR, SECO awards, or utility rebates for verified consumption reductions.

# Challenges & Lessons Learned



## Stakeholder Buy-In Is Essential

This cannot be an individual effort. Sustainability reporting touches facilities, finance, IT, and leadership. Cross-departmental involvement is critical for data access, validation, and action on the insights.



## Utility Data Format Dependency

The pipeline depends on the PDF format of utility bills from CoServ and Gexa. Any format change breaks extraction. Ideally, utilities would share consumption data in structured formats (CSV, API) rather than PDF.



## Adoption Over Innovation

Without genuine interest in using the data for decision-making, a project like this becomes a pet project. The real value is in people actually using the insights to drive efficiency and accountability.



## Cloud Migration Needed

The current setup runs on a local task scheduler and SharePoint. Moving to a cloud-based architecture (e.g., Azure Functions, AWS Lambda) would improve reliability, scalability, and reduce single points of failure.



# Thank You

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Questions & Discussion

Haris A. Y. Khan | Sustainability Analyst | City of Frisco, Texas

# Connect with us:

**YouTube Channel**



**Newsletters**

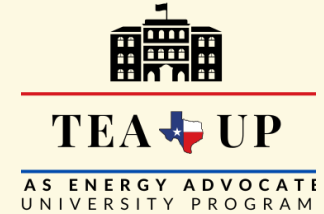


**LinkedIn**





# SPEER Peer Learning Programs: The Power of Partnerships



## Community Efficiency Leadership Coalition (CELC)

A collaborative network of Texas cities, school districts, and public entities advancing energy management best practices.

### Key Benefits:

- ✓ Monthly Professional Development Meetings
- ✓ 1,000+ professional network
- ✓ 10 hours/year of technical assistance
- ✓ Policy templates & case studies
- ✓ Professional Learning Opportunities



## TEXAS Energy Advocacy University Program (TEA-UP)

A coalition that brings leaders from universities, energy managers, academics, students, industry, and the energy sector together to drive progress in energy efficiency.

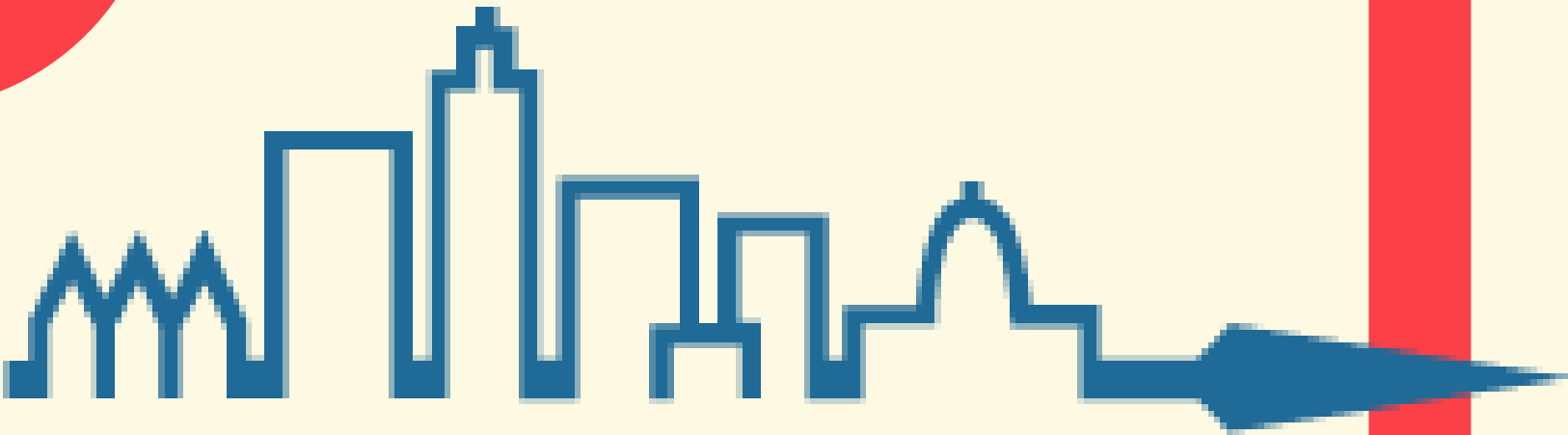
### Key Benefits:

- ✓ Focused largely on higher education & specific needs
- ✓ Quarterly coalition meetings
- ✓ Expert insights & workshops
- ✓ Policy initiative exploration
- ✓ Resource & partnership connections
- ✓ Regional collaboration
- ✓ Professional Learning Opportunities





**SPEER**



*The South-central Partnership for Energy Efficiency as a Resource*