

# FEDERAL UTILITY PARTNERSHIP WORKING GROUP SEMINAR

August 21 – August 22, 2024

## Welcome to the Summer 2024 FUPWG Seminar – Day 2!

*The opening Welcome & Announcements from FEMP will begin at 8:20AM CT*





# Welcome and Announcements – FUPWG Day 2

John Michael Forrest

*DOE FEMP Program Manager*

August 22, 2024



# Welcome to FUPWG Day 2!

- Highlights from Day 1
- Thank you to CenterPoint Energy for a great networking event!
- Please wear your badge at all times. Your badge is required for entry.
- Lunch
  - Will not be provided today, but there are several nearby options.
- Special Session 1: Energy Lawyers and Contracting Officers Forum (Open to all FUPWG Attendees) 1:00PM – 2:30PM CT

Slides will be posted to the FUPWG website within 2 weeks.

# FEDERAL UTILITY PARTNERSHIP WORKING GROUP SEMINAR

August 21 – August 22, 2024

## Priority Setting: DOE's Secretary's Performance Contract Challenge

Skye Schell, DOE FEMP on Behalf of the Sustainability  
Performance Office, Office of Management DOE





# Secretary's Performance Contract Challenge

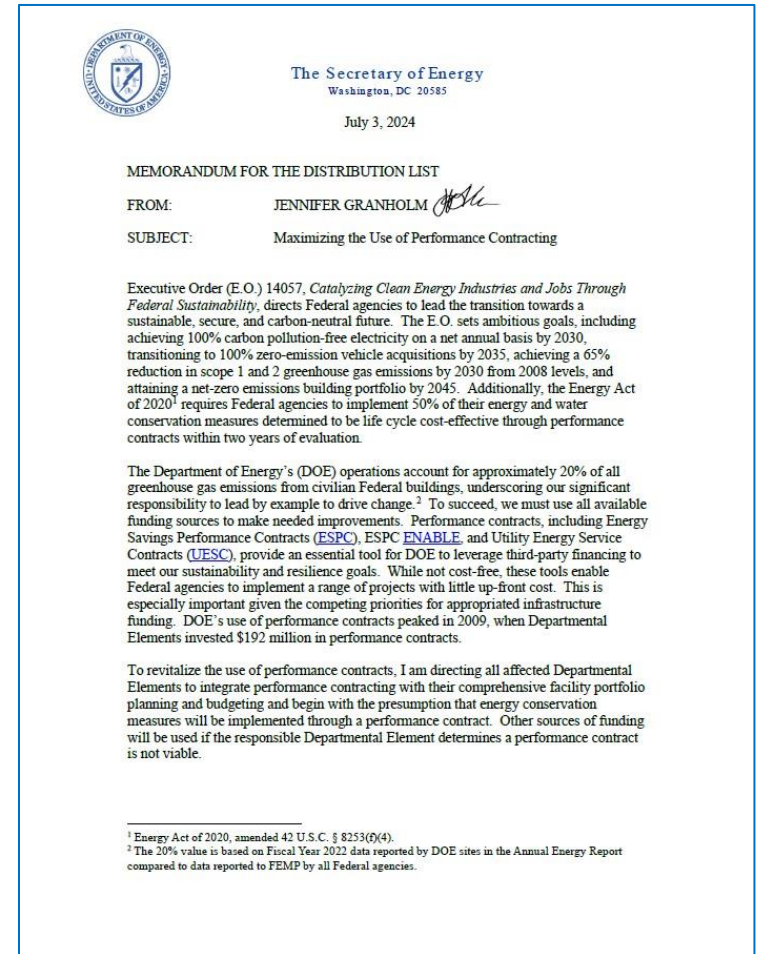
Memorandum signed July 3, 2024

- **Requires the Department to**

- Leverage \$100M/yr in performance contracts (PC)
  - IGAs for new projects or task orders
  - ESPC, ENABLE, UESC
  - Leverage all available funding sources – PCs, appropriations, AFFECT, developer rebates, etc.
- Integrate performance contracting into facility portfolio planning and budgeting
- Start with the presumption that ECMs will be implemented through PCs; ensures compliance with Energy Act of 2020 requirements
- SPO and FEMP provide support

- **Projects will meet DOE sustainability goals**

- Net-Zero Buildings (ECMs, electrification)
- CFE (onsite solar PV)
- Resilience (microgrid pilots)



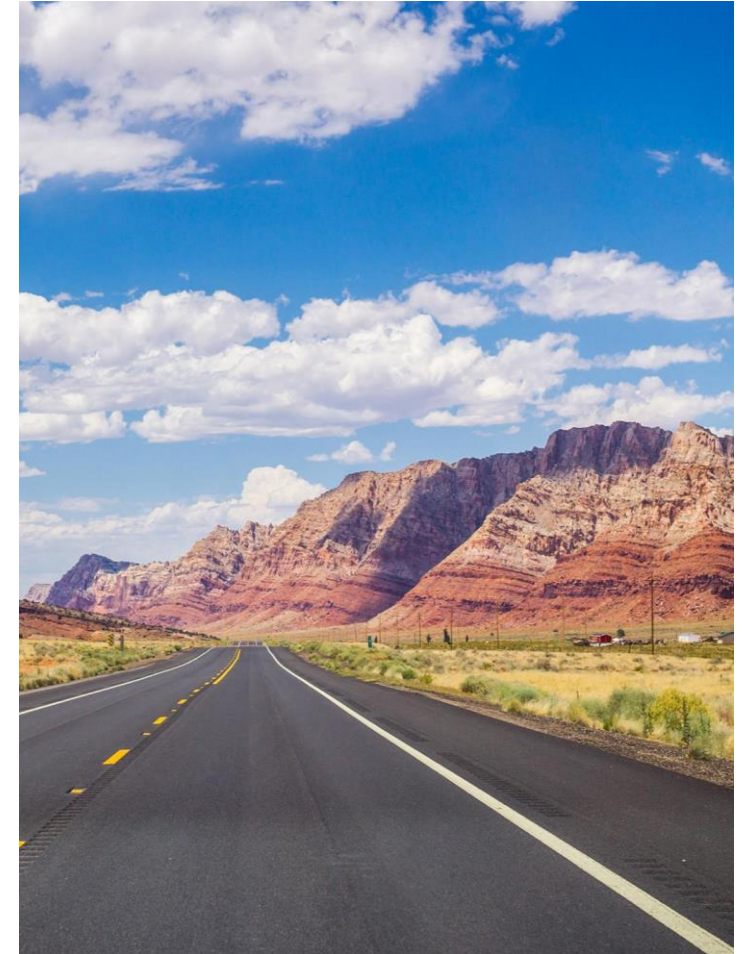
# Implementation

## Currently

- Webinars & training
- Technical assistance, problem solving, facilitate connections with FEMP SMEs
- Support for AFFECT grant applications

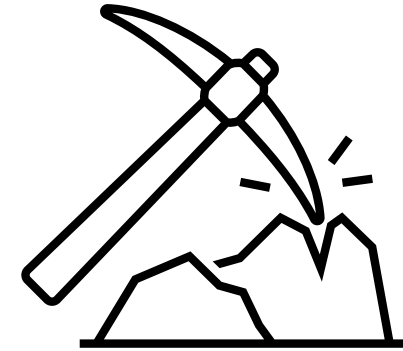
## Going forward

- CSO kick-off with program offices and FEMP at DOE's Sustainability Summit
- Launch DOE Performance Contract Center of Expertise
  - Leverage DOE's broad expertise (technical, procurement, legal)
  - Best practices, innovations, solutions
  - Track & maintain progress
- Update ESPC Review Board to reflect current priorities and manage increased project load



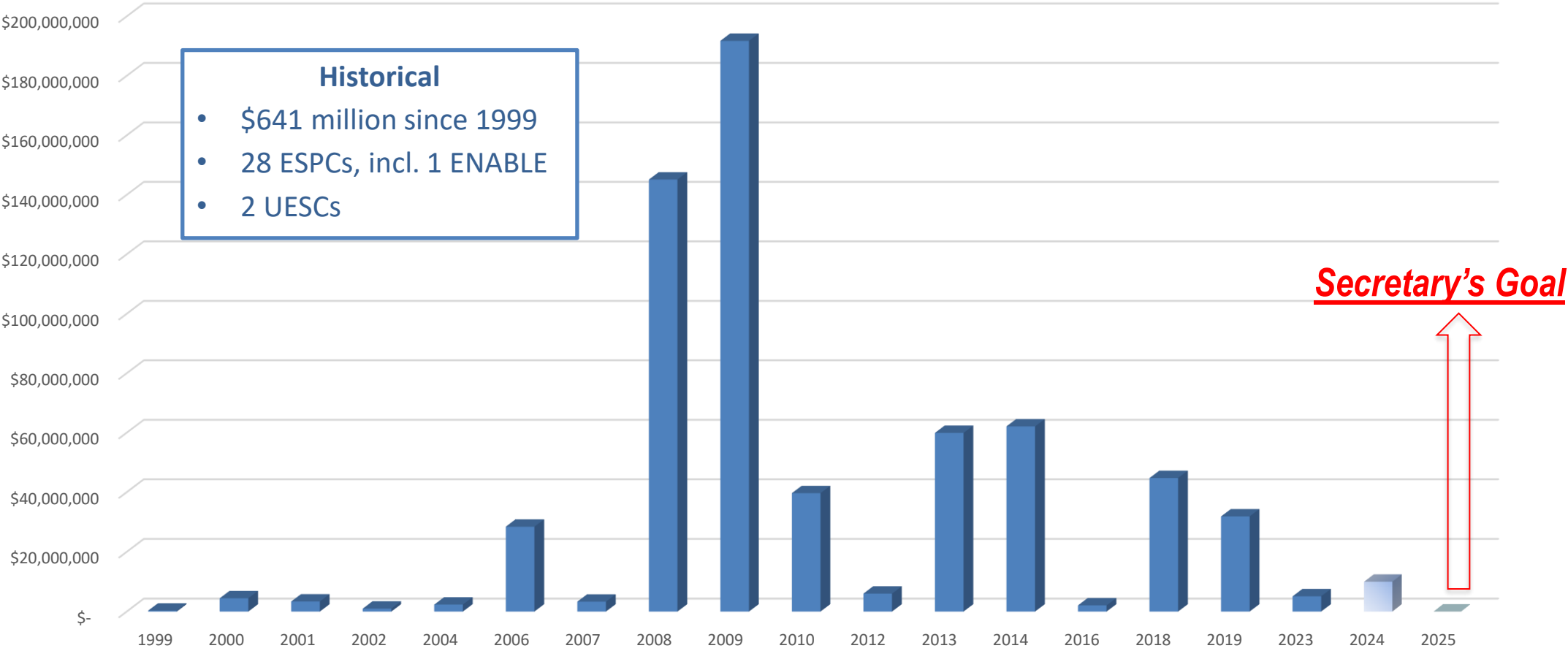
# Challenges

- **Implementation**
  - Low electricity rates (~\$0.05 kWh)
  - Remote locations
  - Safety & security requirements
- **M&O structure**
  - Complex contract procedures & lengthy approval processes
  - Some field offices lack specialized procurement expertise
- **Mission takes priority**
  - National security facilities & sites
  - High-energy facilities, incl. particle accelerators & supercomputers



# DOE Performance Contract Investment

*1999-present (only years with PC activity)*



# Preliminary Pipeline

*Data not yet finalized*

FY 2024-25	
IGA Final or Near-Final	1
ESCO Selected	1
NOO/Letter of Interest Under Development	8
UESC in Development	4



# Thank you

Contact:

*Steve Bruno*

*DOE Sustainability Performance Office*

[sustainability@hq.doe.gov](mailto:sustainability@hq.doe.gov)



# WALKER REID

## Energy Tax Incentives

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### UNDERSTANDING §179D MAXIMIZATION & ALLOCATION



David Diaz, Managing Partner  
Walker Reid



# OUR JOURNEY

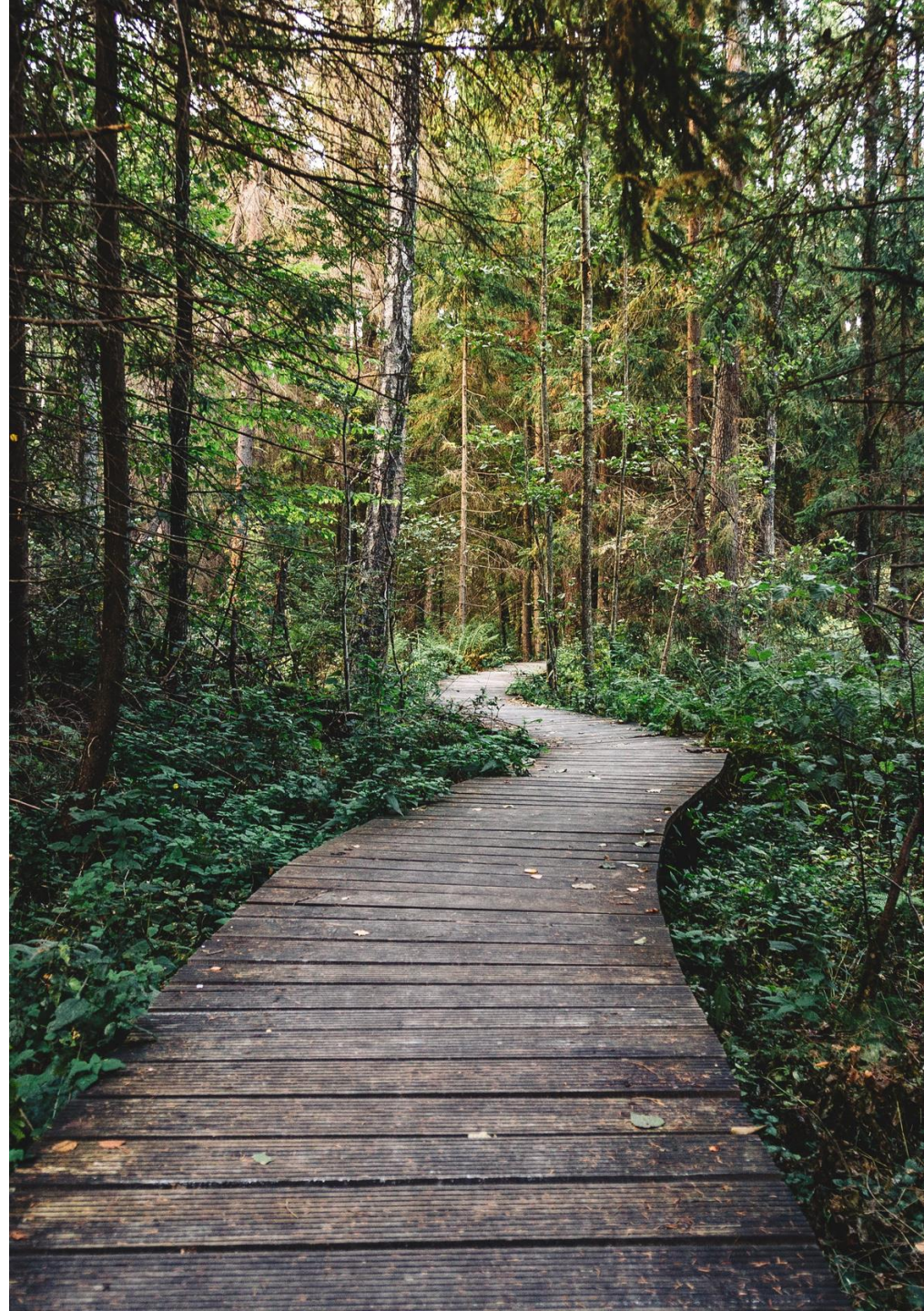
## WHAT IS §179D

WHY §179D IS AN IMPORTANT  
CONSIDERATION IN PROJECT  
DEVELOPMENT

HOW CAN §179D BE MONETIZED  
OR TRANSFERRED  
(COMPLIANCE AND  
REASONABLENESS)

OPPORTUNITY TYPES

HOW TO GET STARTED!



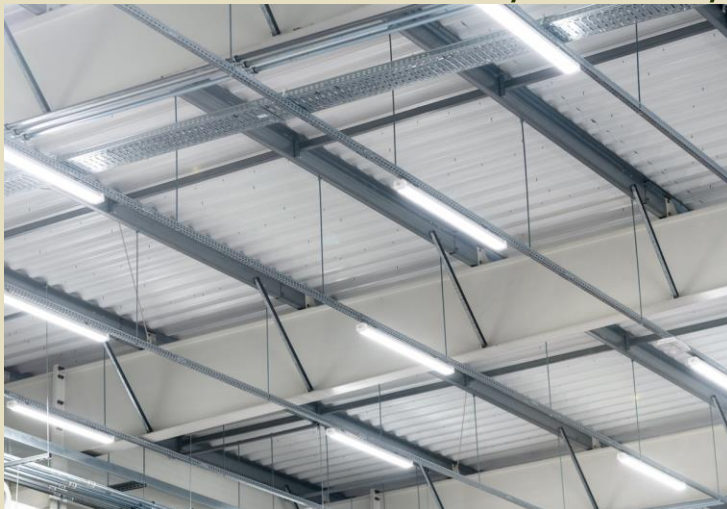




# WHAT IS §179D:

**ESTABLISHED UNDER ENERGY POLICY ACT OF 2005 (EPACT)**

PROVIDES FOR A DEDUCTION OF UP TO \$1.80/SF FOR  
ENERGY EFFICIENT IMPROVEMENTS FOR  
LIGHTING/HVAC/ENVELOPE:



# KEY POINTS

- **INFLATION REDUCTION ACT CHANGES**
- ASHRAE 90.1-2007 IS CURRENT STANDARD  
25%-50% VS THE STANDARD.
- **Maximum Deduction of \$0.50-\$1.00/sf, with a  
bonus deduction of \$2.50-\$5.00/sf if meets  
prevailing wage requirements**
- Transfer available by tax-exempt entities  
(SCHOOLS/MUNICIPALITIES/LOCAL GOV/**FEDERAL  
GOVERNMENTS**/NON-PROFITS ETC.)
- **Safe Harbor for PREVAILING WAGE/apprenticeship  
IF construction that begins PRIOR 1/30/23**



Changes apply to tax years FOR PROJECTS COMPLETED  
after 12/31/2022





# KEY POINTS

IRA 2022

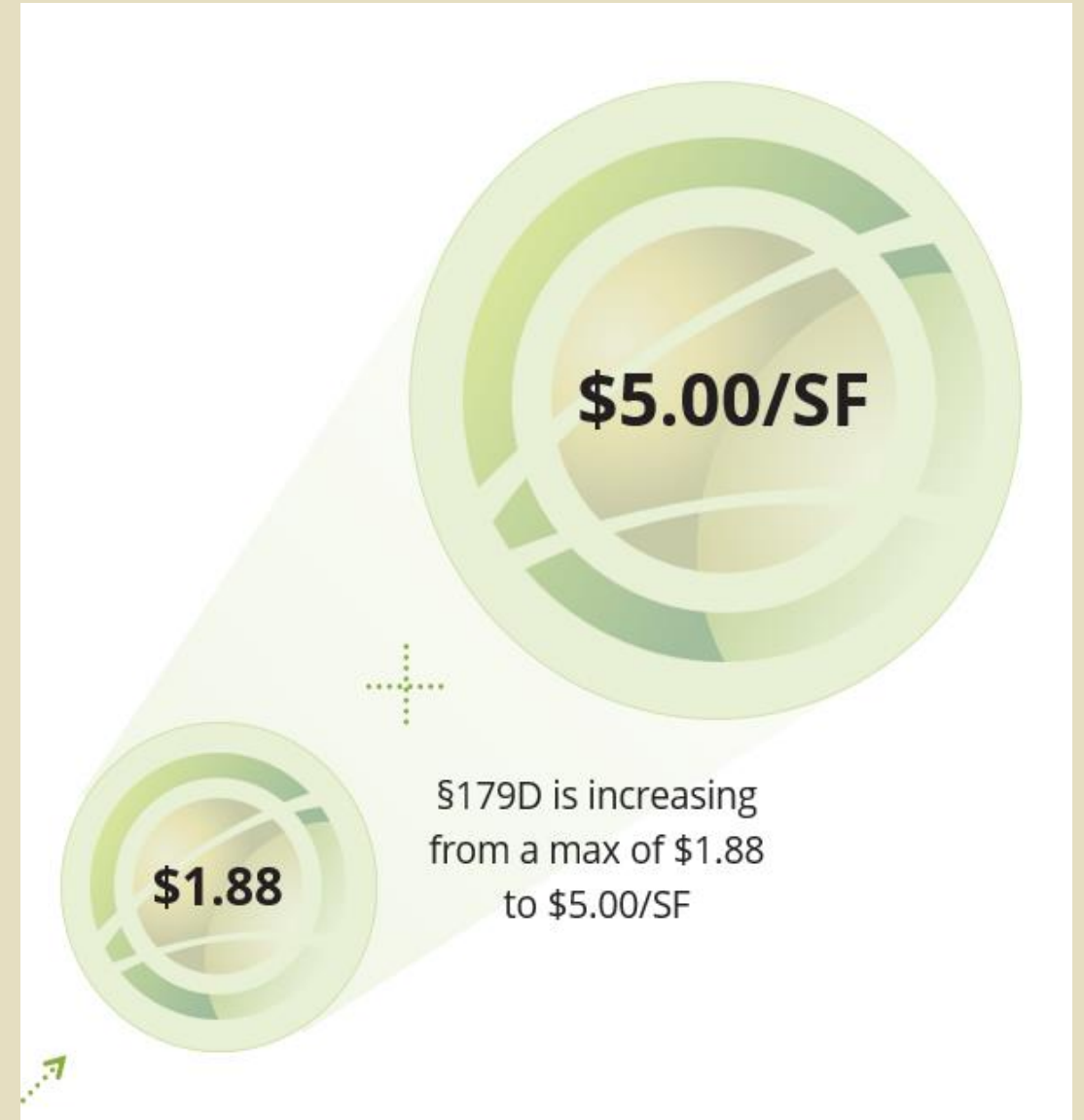
## §179D Changes

Key Relevant Changes- for EECBP Placed in service after **1/1/2023**

**25% Reduction** as starting point, with additional benefit per every percentage point improvement against ASHRAE 90.1 Standard in place 4 years prior to the date in which the building was placed in service.

		Key Relevant Changes- for EECBP Placed in service 1/1/2023		
		25% Reduction	Each additional % Point	50% or Higher
Prevailing wage & apprenticeship requirements	Meets	\$2.50/SF	\$0.10/SF	\$5.00/SF
	Does not meet	\$0.50/SF	\$0.02/SF	\$1.00/SF

Prevailing Wage will determine the starting point of the benefit



# Allocate/Transfer

- **Allocation Letter Process**
- Responsibilities under the allocation can ONLY be allocated to designers.
- **Pitfalls around allocation letters**
- Agency Specific requirements
- **IRS's definition of Designer Per §179D Rules**



A designer is a person that creates the technical specifications for installation of energy efficient commercial building property (or partially qualifying commercial building property for which a deduction is allowed under § 179D). A designer may include, for example, an architect, engineer, contractor, environmental consultant or energy services provider who creates the technical specifications for a new building or an addition to an existing building that incorporates energy efficient commercial building property (or partially qualifying commercial building property for which a deduction is allowed under § 179D). A person that merely installs, repairs, or maintains the property is not a designer.

# MONETIZATION

## §179D SAMPLE OPPORTUNITY

Project	Square Footage	§179D Tax Deduction Rate	Total Available §179D Deduction	Designer Effective Tax Rate	Available Cash Value
Fed Bldg A	42,500	\$5.36	\$227,800.00	21%	\$47,838.00
Fed Bldg B	28,900	\$5.36	\$154,904.00	21%	\$32,529.84
Fed Bldg C	87,000	\$3.72	\$323,640.00	21%	\$67,964.40
Fed Bldg D	220,000	\$5.36	\$1,179,200.00	21%	\$247,632.00
			<b>Total 179D Tax Deduction</b>		<b>\$395,964.24</b>
			<b>Less Value Guarantee Study</b>		\$22,704.00
			<b>Less Final Certification (At Completion)</b>		\$18,920.00
			<b>Total Remaining Deduction Value</b>		<b>\$354,340.24</b>



## §179D SAMPLE CASH SPLIT

TOTAL REMAINING CASH VALUE  
\$354,340.24

Tax Exempt Entites Share	Tax Exempt Entity Share %	Federal Government Benefit	Designer Benefit
Net Value to Tax Exempt Entity	80%	<b>283,472.19</b>	\$70,868.04
Net Value to Tax Exempt Entity	35%	<b>\$124,019.08</b>	\$230,321.16
Net Value to Tax Exempt Entity	30%	<b>\$106,302.07</b>	\$248,038.17

# OPPORTUNITY TYPES

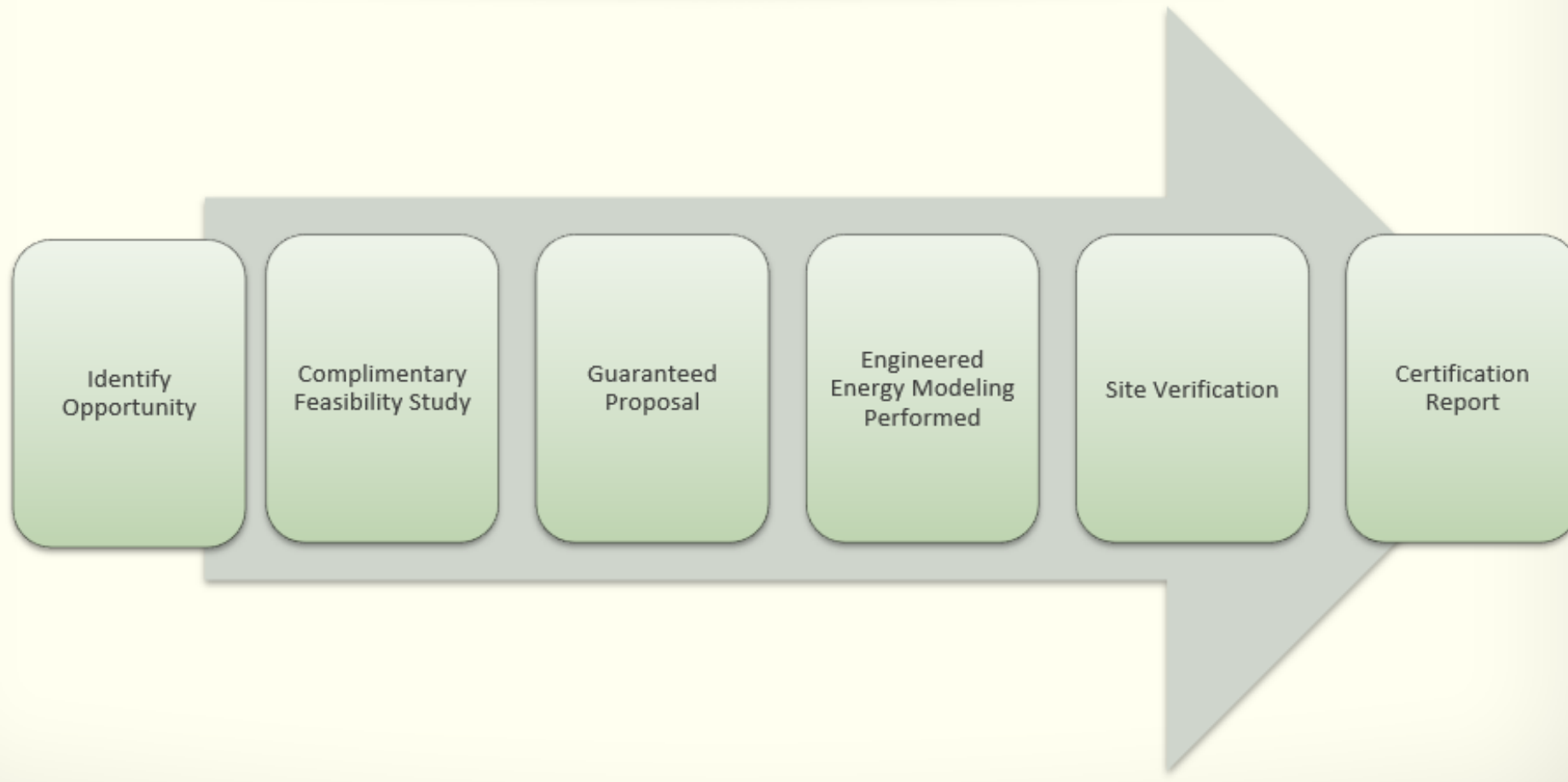
- **NEW CONSTRUCTION**
- **ALTERATIONS/ADDITIONS**
- **RETROFITS/ENERGY SERVICES PROJECTS**

## **PROJECTS THAT DO NOT QUALIFY**

- **SOFTWARE ONLY PROJECTS**
- **COMMISSIONING ONLY**
- **NON ENERGY SAVING MEASURES**



# OUR PROCESS



# GET IN TOUCH



## Contact us to get more info:



[DDIAZ@walkerreid.com](mailto:DDIAZ@walkerreid.com)



1225 Broken Sound Parkway Suite C  
Boca Raton FL, 33487



800.662.1793



[www.walkerreid.com](http://www.walkerreid.com)



**DLA**  
DEFENSE LOGISTICS AGENCY  
*Established 1961*



The Nation's Combat Logistics Support Agency

# Defense Logistics Agency Energy

Charlene Woods, Contracting Officer

Bob Knudson, Contracting Officer

August 2024

WARFIGHTER ALWAYS



# Mission & Vision

## Mission

*The Defense Logistics Agency Energy's mission is to enable mission readiness by providing globally resilient energy solutions to the Warfighter and Whole of Government*

## Vision

*DLA Energy's vision is to be the trusted leader in innovative energy solutions aligned with the speed of change*





# Carbon Pollution Free Electricity (CFE)







# Priorities and Objectives

## Priorities for CFE Procurement

- **Promote Energy Resilience<sup>1</sup>** : Support programs and investments that improve energy resilience.
- **Advance CFE**: Support programs, tariffs, and other initiatives that enable scaled procurement of CFE.
- **Secure Fair Pricing**: Seek to obtain the lowest reasonable cost for electricity based on procurement structure and local market factors.

## Objectives for Market Engagement

- Enroll in available programs that are compliant with E.O. 14057.
- Work with utilities to develop new CFE programs or products.
- Partner with industry for onsite development, energy efficiency or other CFE related technologies.
- In markets with retail choice, secure additional, cost effective CFE that provides resiliency benefits.

1. Energy resilience is defined as "the ability to avoid, prepare for, minimize, adapt to, and recover from anticipated and unanticipated energy disruptions in order to ensure energy availability and reliability sufficient to provide for mission assurance and readiness, including mission essential operations related to readiness, and to execute or rapidly reestablish mission essential requirements", 10 USC 101(e)(6)



# Commitment to Accelerating the Clean Energy Transition

## Carbon-Free Sources



Solar



Wind



Marine & hydrokinetic<sup>1</sup>



Renewably sourced hydrogen



Geothermal



Nuclear



Hydroelectric



Fossil resources w/ active capture & storage<sup>2</sup> of CO<sub>2</sub>

## Carbon Pollution-Free Electricity (CFE) targets in EO 14057



**100% annual CFE use**  
by 2030 for the federal government



**50% hourly matched CFE use**  
by 2030 for the federal government



**Expanded on-site generation**  
at federal sites

1. Includes tidal, wave, current, and thermal 2. Capture and storage of carbon dioxide emissions must meet EPA requirements  
More information can be found in the *Implementing Instructions for Executive Order 14057 Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*



# CFE Sourcing Strategies

Agencies are deploying four distinct, additive CFE sourcing strategies to meet 2030 CFE targets

## Grid-supplied CFE

CFE delivered as part of default electricity service

## Onsite CFE

CFE generated onsite at federal sites from CFE-compliant sources

## Purchased CFE

CFE generated off-site in addition to grid mix, procured from a utility or retail provider

## Energy Attribute Certificates (EAC)-Only

Certificates (e.g. RECs, EFECs, ZECs) for CFE procured separately from the electricity

**100% CFE on an annual basis**

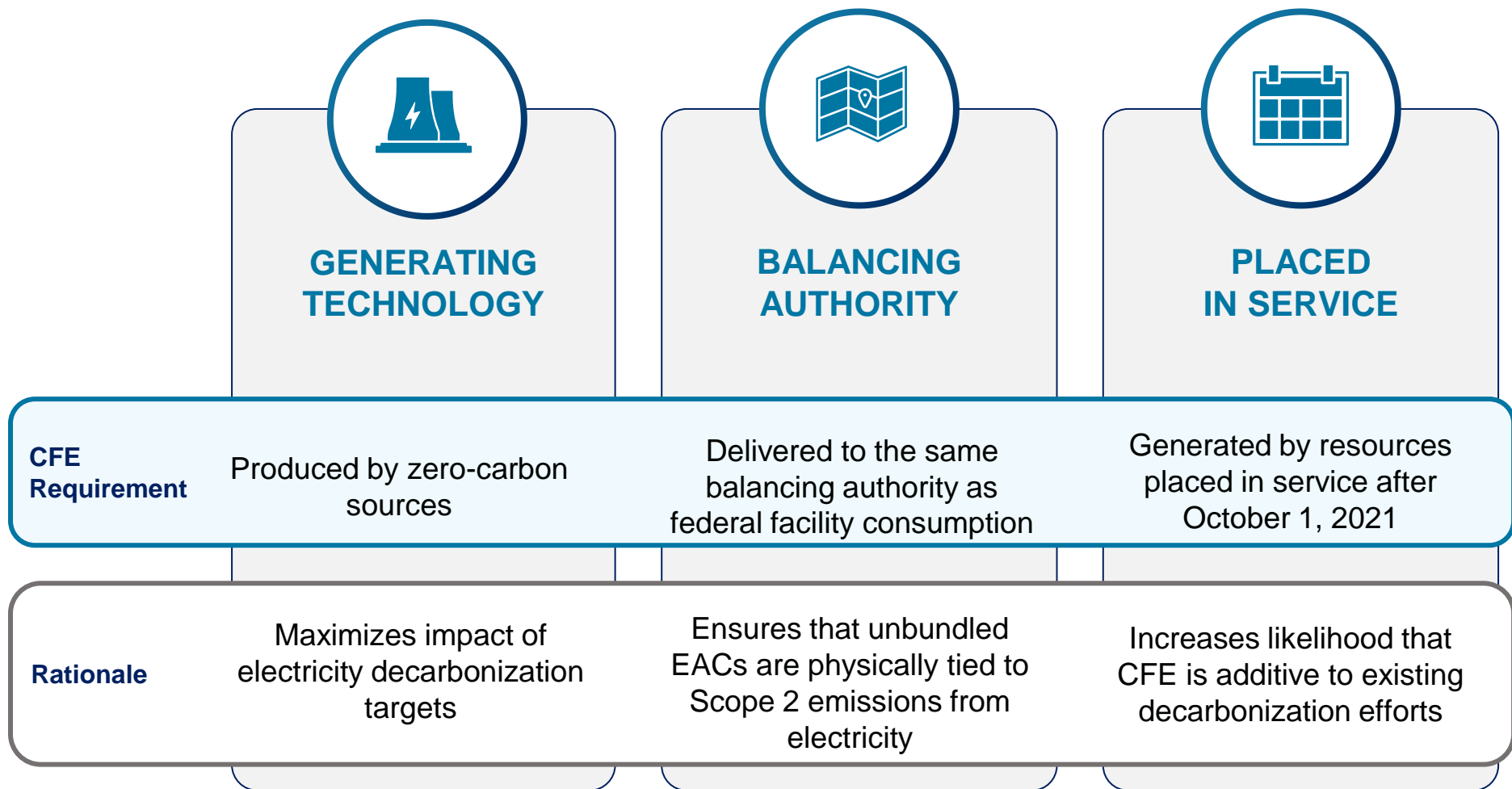
More information can be found in the *Implementing Instructions for Executive Order 14057 Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*

Source: EO 14057

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# CFE Requirements Optimize the Impact of CFE Procurements



Note: All solicitations must be compliant with all Federal Acquisition Regulations, Defense Federal Acquisition Regulation, and DLA contracting guidelines: [Policy and Directives \(dla.mil\)](#)

Source: EO 14057

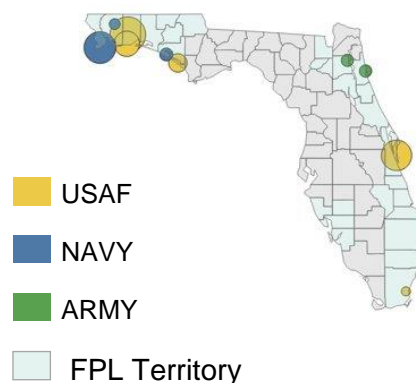
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# Recent DoD CFE Procurements

## F P L

**FY 2022 consumption<sup>1</sup>:** 850 GWh  
**FY 2022 on-site generation:** 10 GWh  
**FY 2030 grid CFE %:** 45% grid CFE  
**FY 2030 forecasted CFE need<sup>2</sup>:** 500 GWh / 200 MW

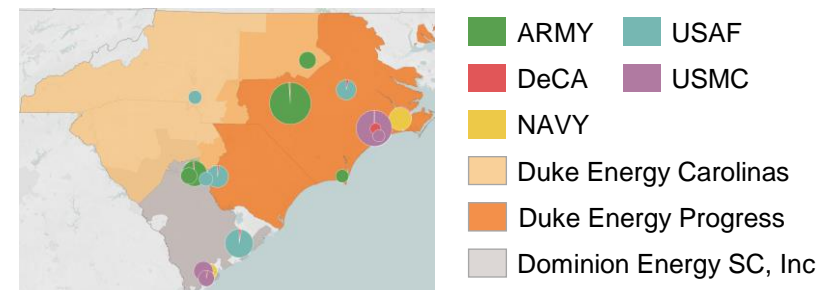


*FPL SolarTogether is a “subscription” model that provided an opportunity for cost savings in year 2 of contract*

DoD installations in Northwest FL have enrolled in 75 MW of existing capacity in Florida Power & Light (FPL)'s SolarTogether program, **achieving 17% of CFE need in FPL territory.**

## D U K E

**FY 2022 consumption<sup>1</sup>:** 1.4 TWh  
**FY 2022 on-site generation:** 22 GWh  
**FY 2030 grid CFE %:** 70% grid CFE  
**FY 2030 forecasted CFE need<sup>2</sup>:** 450 GWh / 200 MW



*DoD contracted with Duke and a third-party developer through a “Sleeved PPA” utility tariff*

DLA Energy has executed contracts for offtake from 135 MW of new-build solar capacity (COD 2027), achieving **nearly 70% of DoD’s 2030 CFE need in Duke territory.**

1. FY21 meter data from installations, excludes on-site generation, rounded; 2. Remainder after accounting for existing onsite CFE generation and grid-supplied, not accounting for planned onsite CFE generation, rounded





# Installation Energy







# Installation Energy Program Overview

## Energy Savings Performance Contracts (ESPCs)

- A contract arrangement between a federal agency and an energy service company (ESCO) to implement energy improvements that offset the price of the project



Misawa AB solar

### ESPC CFE Highlights

- ✓ Misawa AB: 6MW solar
- ✓ Keesler AFB: 1.5MW solar
- ✓ JB San Antonio: 18MW solar

## Power Purchase Agreements (PPAs)

- A contract arrangement in which a third-party developer installs, owns and operates an energy system on Military Service real property or private property

### PPA CFE Highlights

- ✓ Fort Hood: 15MW solar / 50MW wind
- ✓ Vandenberg SFB: 28.2MW solar
- ✓ Fort Detrick: 14.6MW solar



Vandenberg SFB solar

## Utility Energy Service Contracts (UESCs)

- A contract arrangement between a federal agency and a serving utility for energy demand reduction and energy efficiency improvements
- The utility assesses the opportunities, designs and installs the project, and fronts the capital costs

## Demand Response (DR)

- Provides incentives to curtail demand and reduce load during peak periods in response to system market conditions

### DR Highlights

- ✓ \$4.6M in FY23 savings

## Retail supply contracts

- A contract for the purchase and delivery of competitive energy supplies to the end-use customers
- Includes natural gas, electricity, coal and LNG

### Retail Supply Highlights

- ✓ ~50M dekatherms of natural gas delivered to 200+ customers across the U.S.
- ✓ ~4.8TWh of electricity procured annually across retail choice markets
- ✓ Coal supply to Alaska installations
- ✓ LNG supply to NS Guantanamo Bay

## Renewable Energy Certificates (RECs)

- An instrument that conveys attributes about a unit of energy, including the resource used to create it and emissions associated with its production / use

### REC Highlights

- ✓ DLA Energy has Basic Ordering Agreements in place to support customer REC purchases

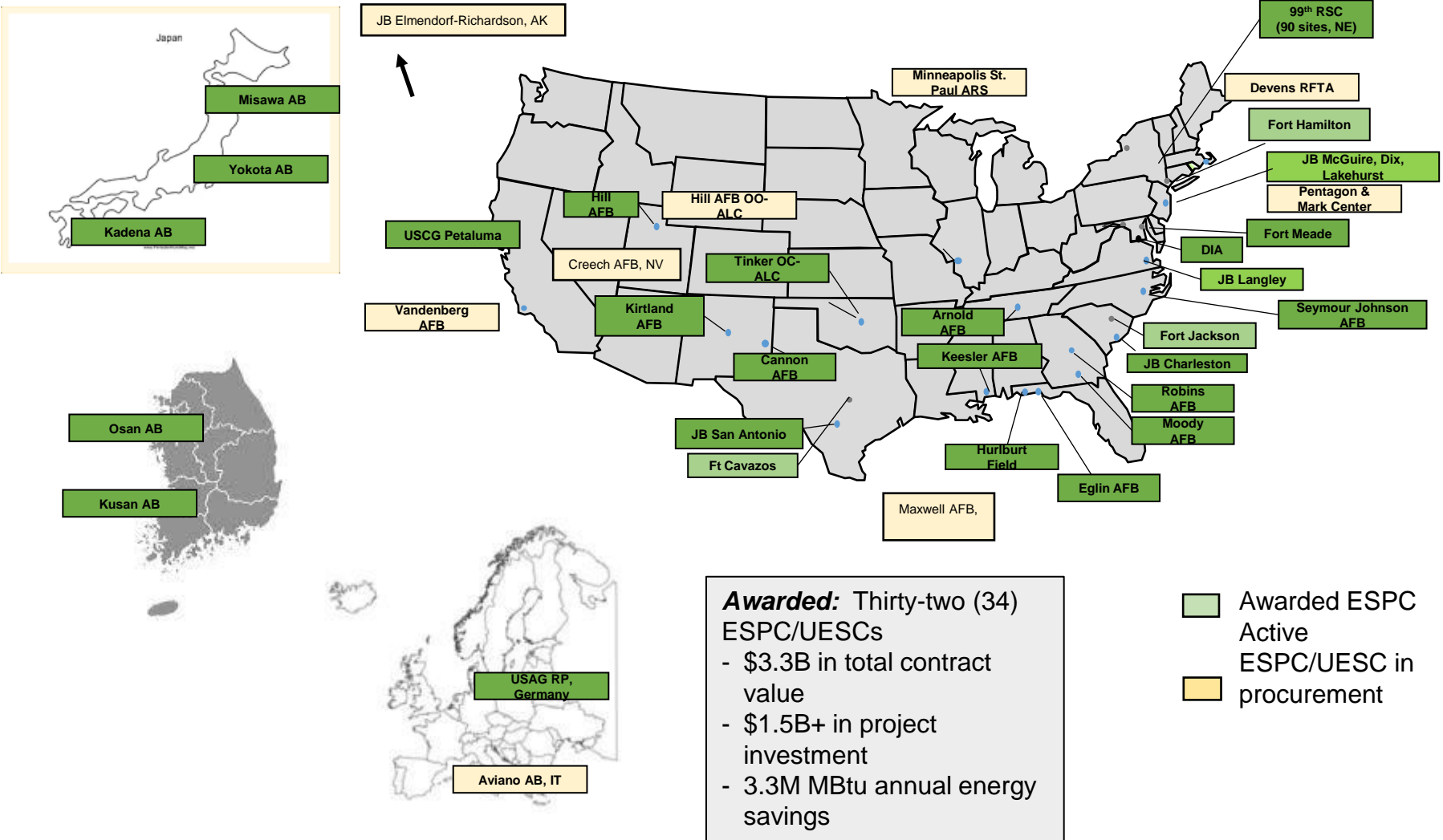


# Installation Energy Program Overview

- ESPC Portfolio:
  - 34 projects supporting Army, USAF, DoD, Army Reserve and USCG locations in CONUS and OCONUS
  - \$3.2B in contract awards supporting \$1.57B in project investment for ~200 ECMs
  - Includes 30MW+ of new renewable energy generation and resiliency measures (microgrid, BESS)
- PPA Portfolio:
  - 3 contracts valued at \$535M supporting Army and Space Force locations in CONUS
  - Includes 57.8MW of on-site solar and 50MW of off-site wind generation installed and the purchase of energy from these resources
- Retail Energy Portfolio:
  - 52 contracts valued at \$1.5B for delivery of electricity, natural gas, and coal to DOD and federal civilian agencies in CONUS
  - 1 LNG contract valued at \$46M supporting Navy in OCONUS



# ESPC/UESC Overview





## Points of Contact

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Contracting Officer  
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Bob Knudson  
Contracting Officer  
(571) 363-8842  
James.Knudson@dla.mil





# FEDERAL UTILITY PARTNERSHIP WORKING GROUP SEMINAR

August 21 – August 22, 2024

## CASE STUDIES

1. Intelligent HVAC Load Management for Energy Efficiency and Resilient Building Operations
2. District Geothermal System

Michelle Rodriguez-Pico, Oklahoma Gas & Electric with Kevin Johnson, Honeywell

Li Song, University of Oklahoma

Tinker Air Force Base (AFB) and University of Miami



# SAFETY MOMENT

Federal Utility Partnership Working Group  
August 21–22, 2024 Houston, TX



# INTELLIGENT HVAC LOAD MANAGEMENT FOR ENERGY EFFICIENCY AND RESILIENT BUILDING OPERATIONS

Tinker Air Force Base (AFB) 

Oklahoma Gas & Electric with Honeywell **OG&E** **Honeywell**

University of Oklahoma and University of Miami  

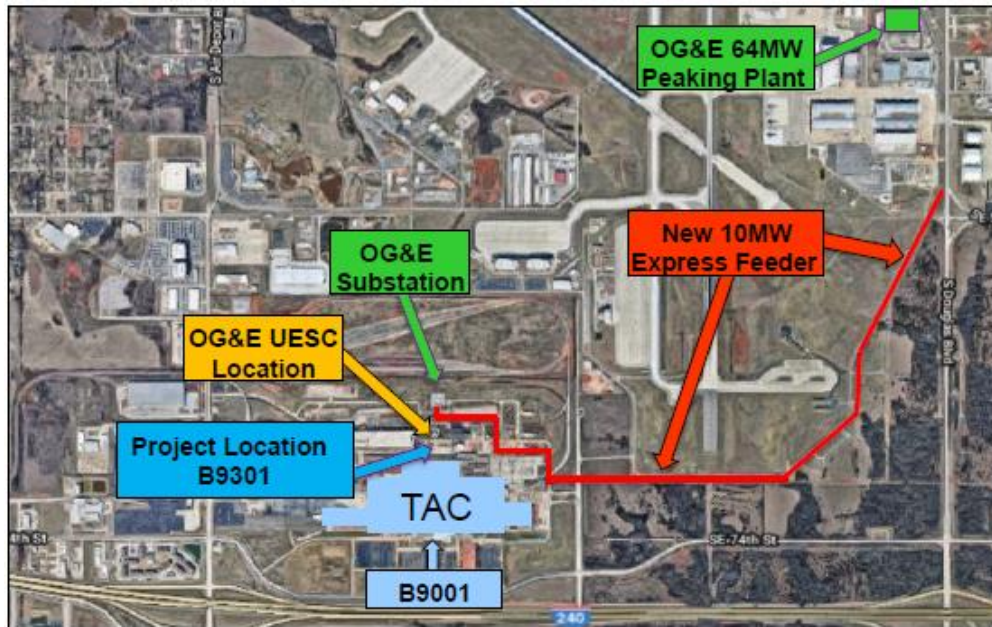


# AGENDA

- Problem Statement
- Technical Objectives
- Technology Description
- Demonstration Site
- Test Results
- Lessons Learns / Current Ops Updates / Future Opportunities

# PROBLEM STATEMENT

Department of Defense (DoD) Installations must be able to sustain mission operations in the event of an outage, but current technology (microgrid) is not cost effective or does not provide significant resiliency potential



- Currently, TAC is not connected to the Tinker Distribution Grid and has no other electrical resilience
- An Express Feed project is currently under construction and will physically connect TAC to Tinker Distribution Grid
- The Express Feed is limited to 10 MW, but current loads at TAC can reach 12 MW

# TECHNICAL OBJECTIVES

## Goals:

- Enhance energy resilience without significant capital cost
- Improve building energy efficiency while using intelligent HVAC load management

## Objectives:

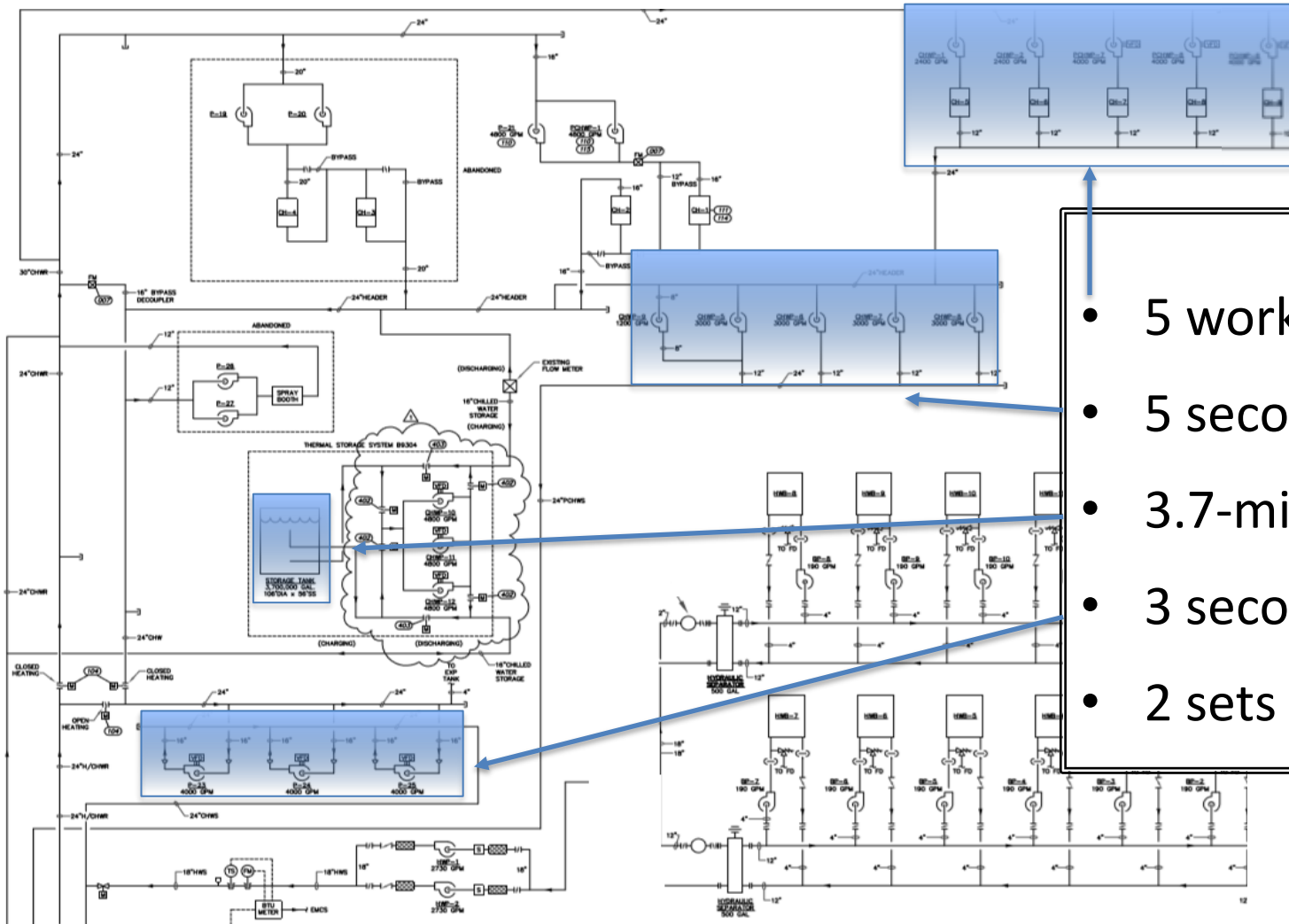
- Evaluate the initial costs and operation and maintenance costs of the load management system.
- Validate the performance through energy savings and demand reduction of the proposed scheme using real-world DoD operating conditions.
- Enable direct technology transfer and commercialization by OG&E which will make the technology available to Tinker AFB and across DoD.

# TECHNOLOGY DESCRIPTION

- Demand management through optimal chilled water (CHW) storage tank charging/discharging operation
- Innovative energy-feedback control for air handling units (AHU)
- Energy-efficient HVAC operation sequences to acquire energy savings



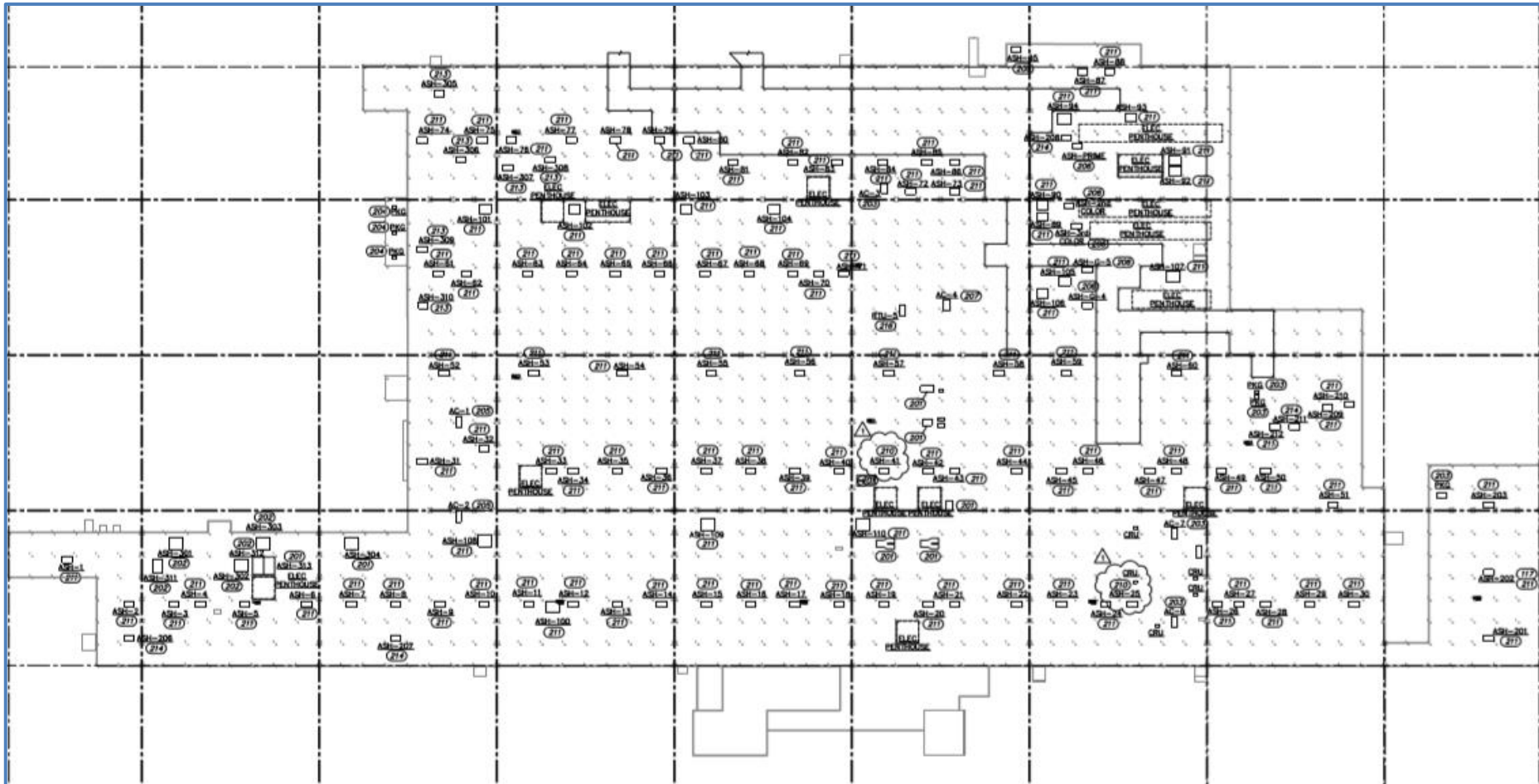
# DEMONSTRATION SITE



- 5 working chillers at 2,000 tons each
- 5 secondary CHW pumps for process
- 3.7-million-gallon CHW storage tank
- 3 secondary CHW pumps for cooling
- 2 sets of cooling towers

# DEMONSTRATION SITE

## Air Handling Units (105 ASH units and 9 single duct VAV)



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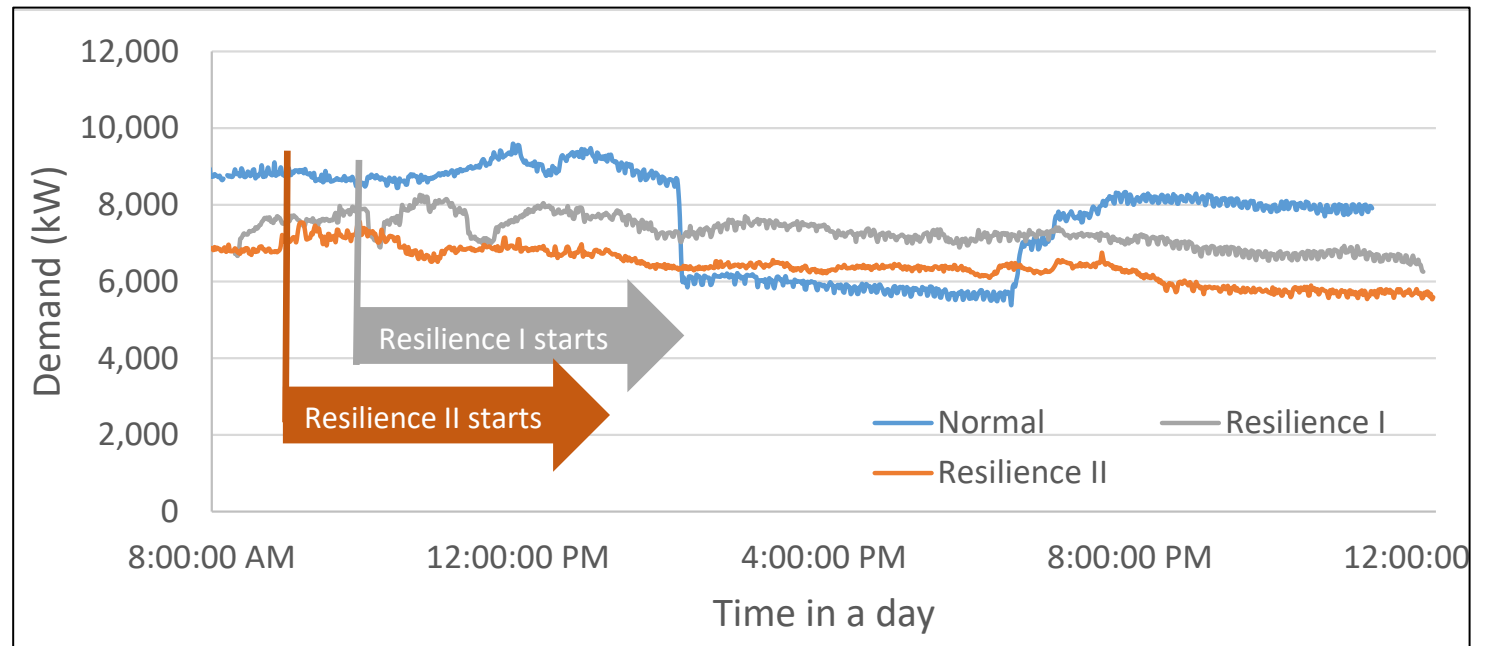
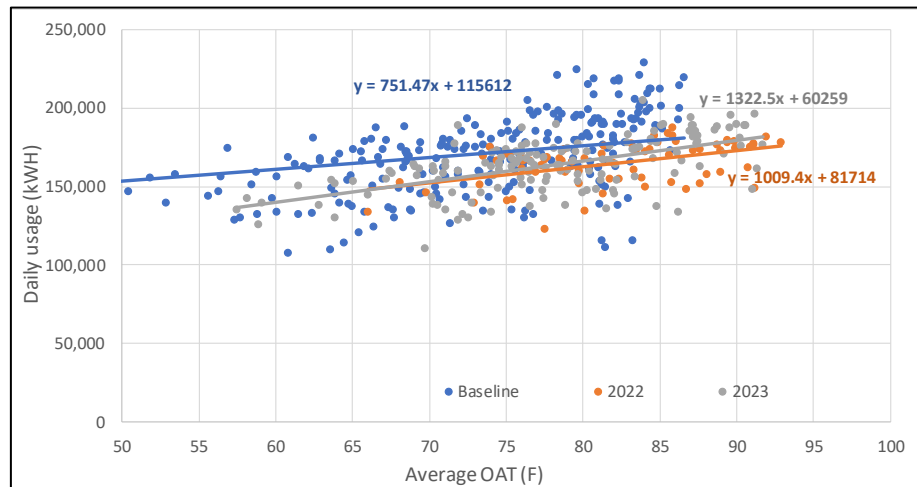
# TEST RESULTS – (PO1 to PO7)

Performance Objective	Metric	Success Criteria	RESULTS
PO1: ASH OA/exhaust air control	ASH cooling energy consumption (Ton-h)	5% reduction compared to baseline	MET 5% REDUCTION
PO2: ASH fan speed/supply air temperature control	ASH fan electricity consumption (kWh)	40% reduction compared to baseline	OBTAINED 30% REDUCTION due to limitation of ASH configuration
PO3: Chiller plant pump and cooling tower fan speed control	Pump and cooling tower fan electricity consumption (kWh)	30% reduction compared to baseline	MET 30% REDUCTION
PO4: Overall energy improv., including implementation of FDD and LCC	Total building electricity consumption (kWh) and costs	5% reduction compared to baseline and consequential savings to investment ratios	EXCEEDED 7.6% REDUCTION – payback is around 4.3 years
PO5: Energy feedback control	Cooling demand (ton) at branches	Cooling demand is controlled within a cooling energy setpoint, such as 90% of the peak cooling demand.	NOT MET due to limitation of ASH configuration
PO6: Energy feedback control with priority index at ASH	Cooling demand (ton) at branches and zone temperature setpoint limits	Cooling demand is controlled within the cooling energy setpoint, such as 90% of the peak cooling demand	NOT MET due to limitation of ASH configuration
PO7: Building demand response with thermal storage	Total power demand (kW)	17% reduction of peak power	MET 14% reduction (on a mild day)

# TEST RESULTS – Performance Data

## Whole-building level electricity 15-min internal data

- Baseline data = Summer 2020, May 2021, June 2021 and the first half of July 2021.
- Post implementation data: 2022 = mid-July to October / 2023 = until Sept. 27, 2023.
- The percentage savings are 7.7% in 2022 and 7.6% in 2023

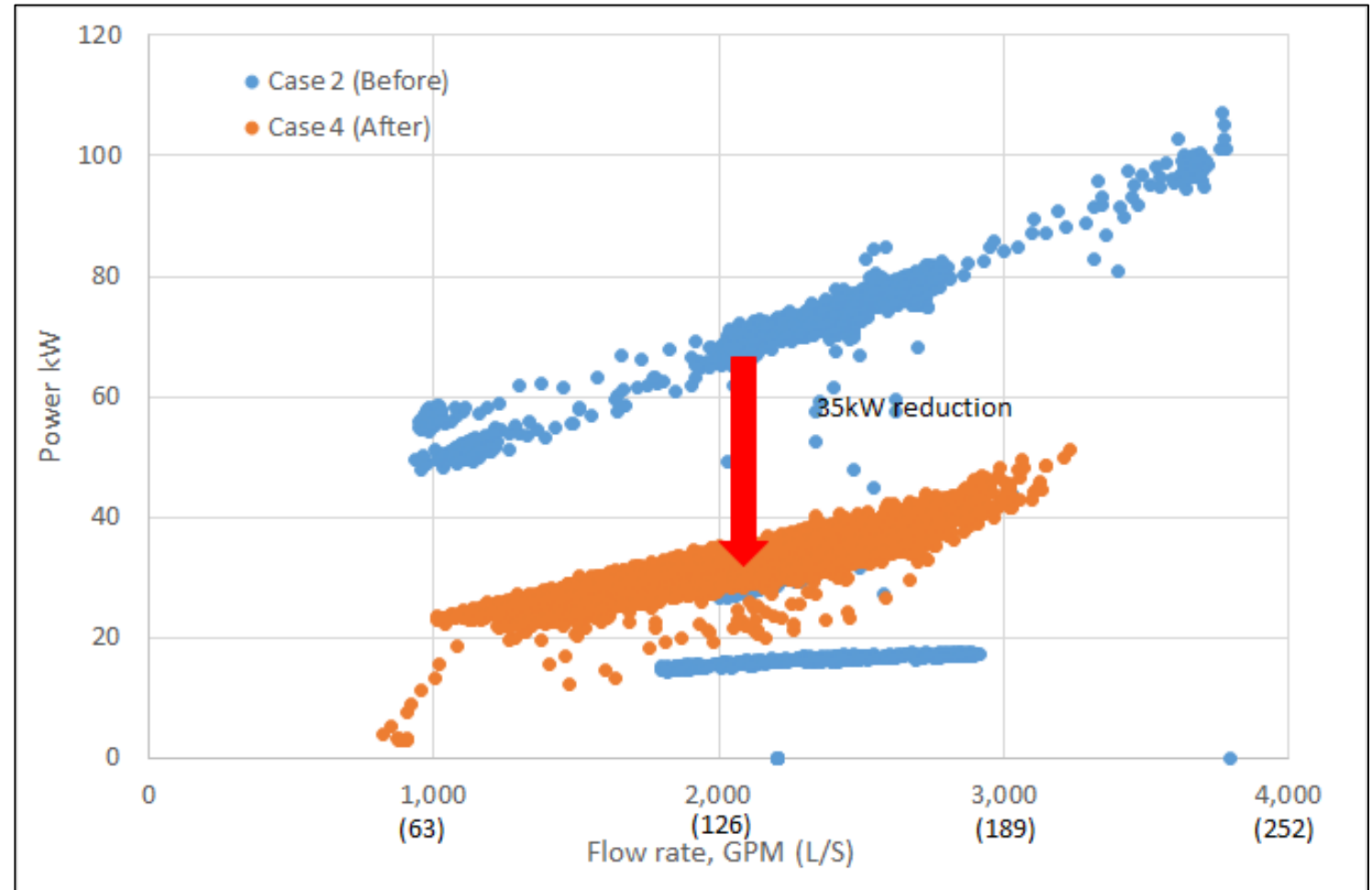




# TEST RESULTS – (PO3)

PO3 (CHW pump control):

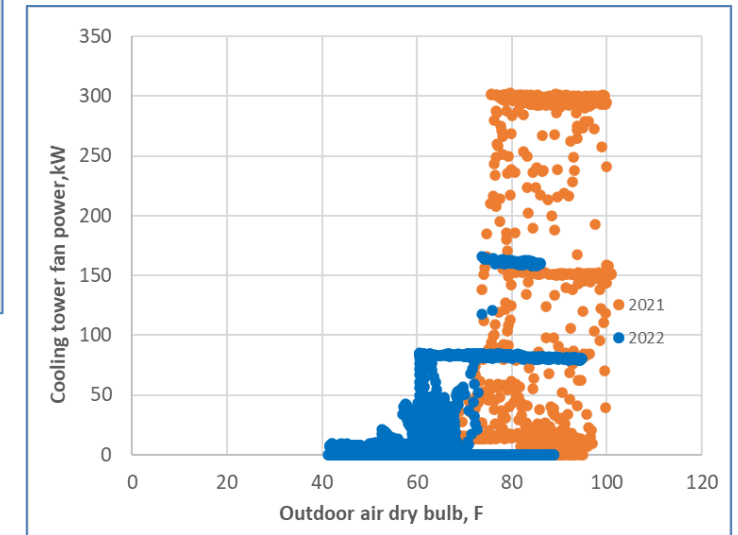
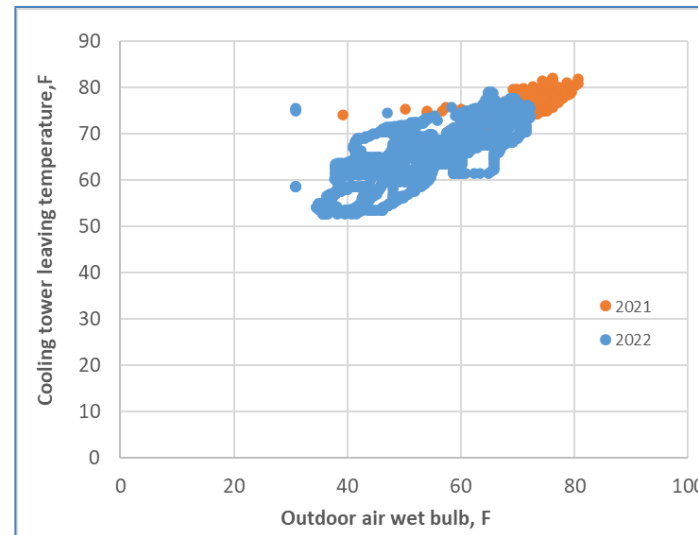
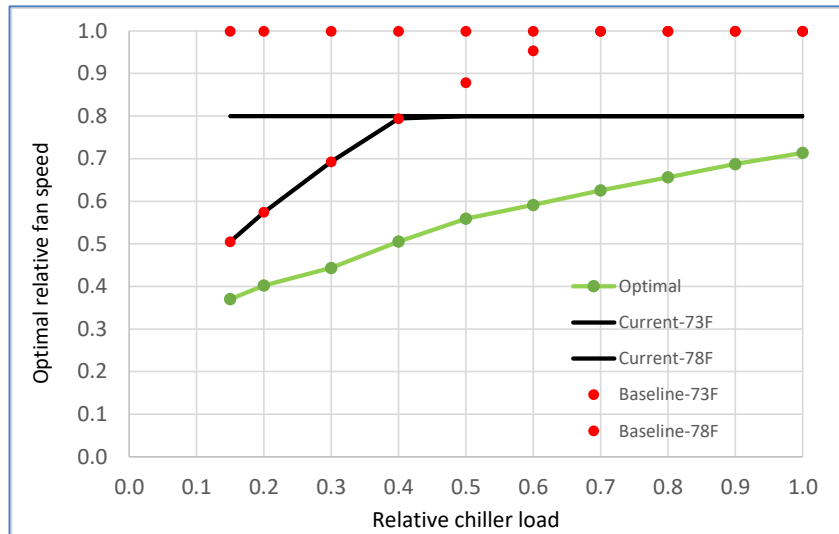
- Optimize the number of operating pumps
- Reset the pressure differential setpoint



# TEST RESULTS – (PO3)

PO3 (Cooling Tower (CT) fan control):

- Optimize the number of CTs / Optimize CT fan speed based on cooling load
- Tower fan power is reduced from 300kW to 150kW / condensing water temp min. change

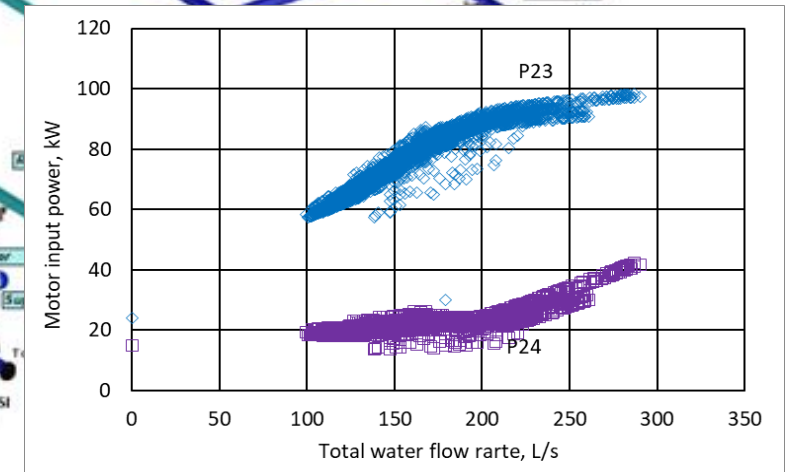
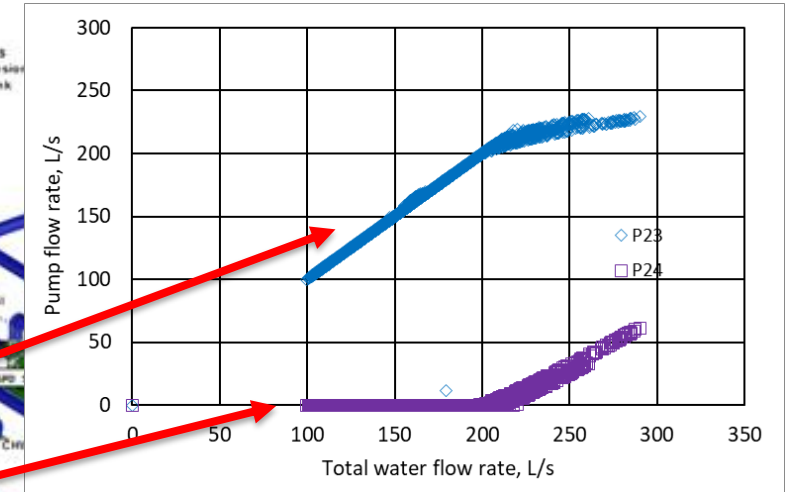
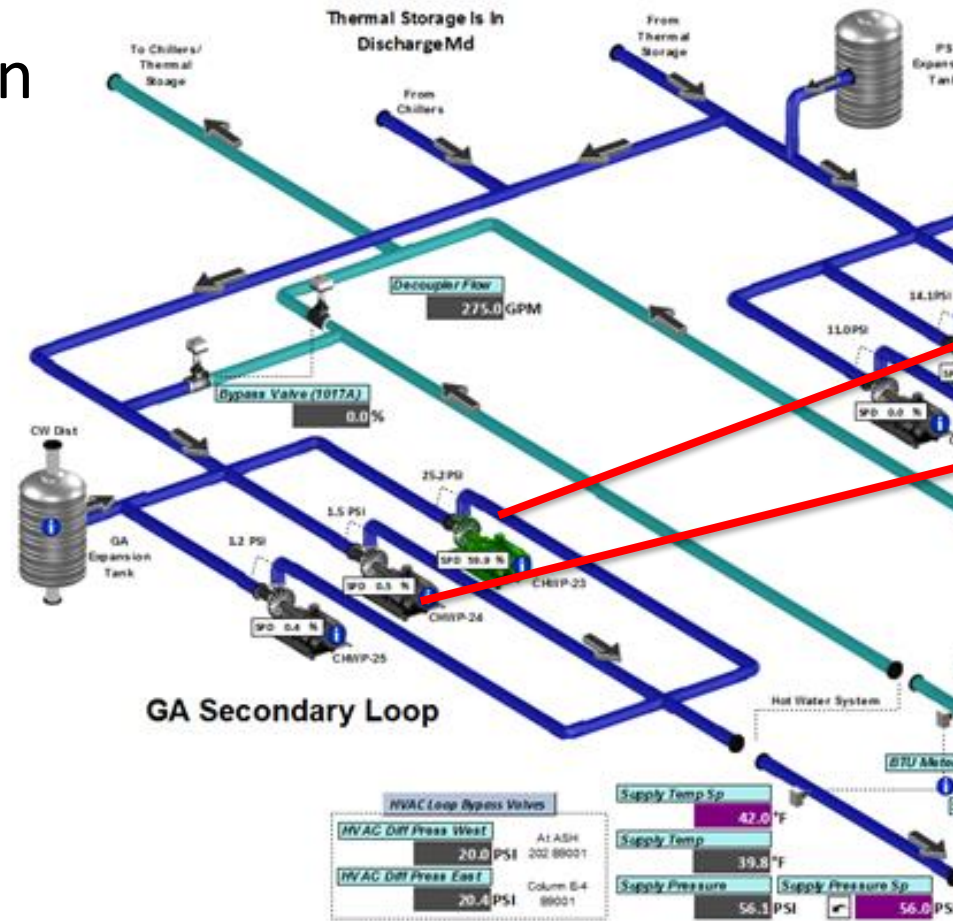


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# TEST RESULTS – (PO4)

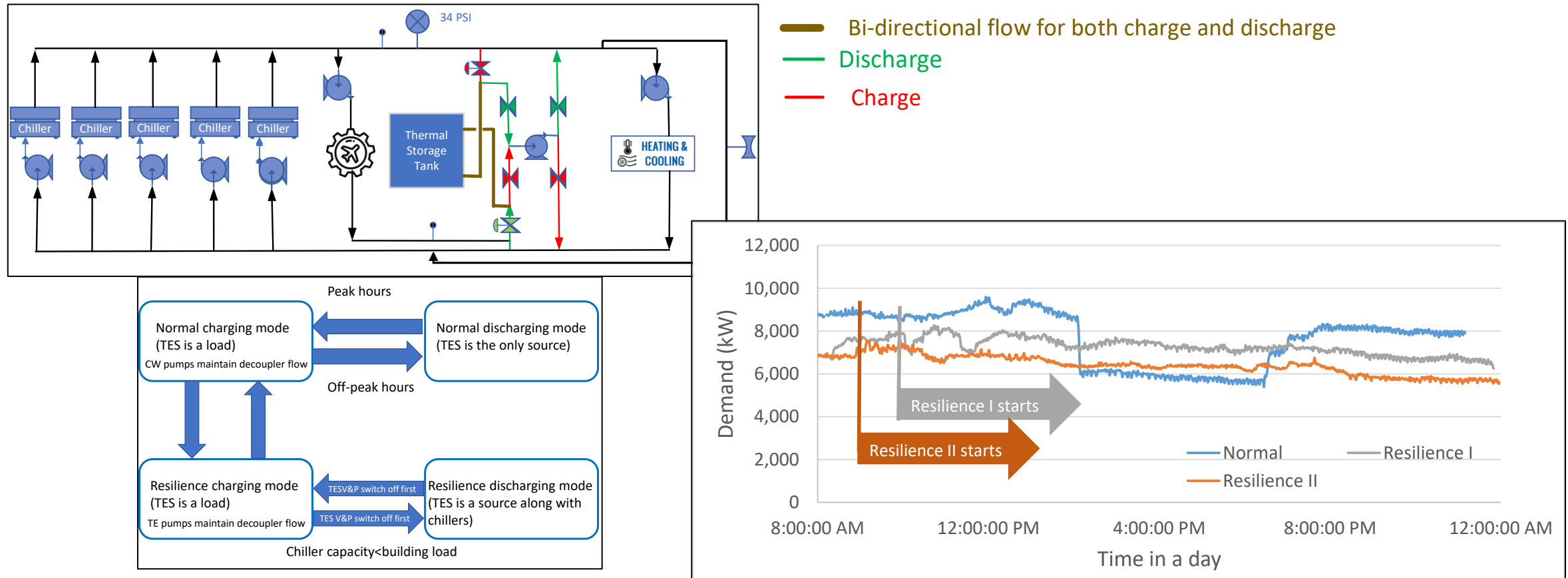
## PO4 (Fault Detection & Diagnostic):

- One of the three HVAC CW pumps had different min speed settings, which resulted in 20kW power waste





# TEST RESULTS – (PO7)

## PO7 (Demand control by optimizing thermal storage tank charge & discharge)



# DISTRICT GEOTHERMAL SYSTEM

University of Oklahoma   
University of Miami 

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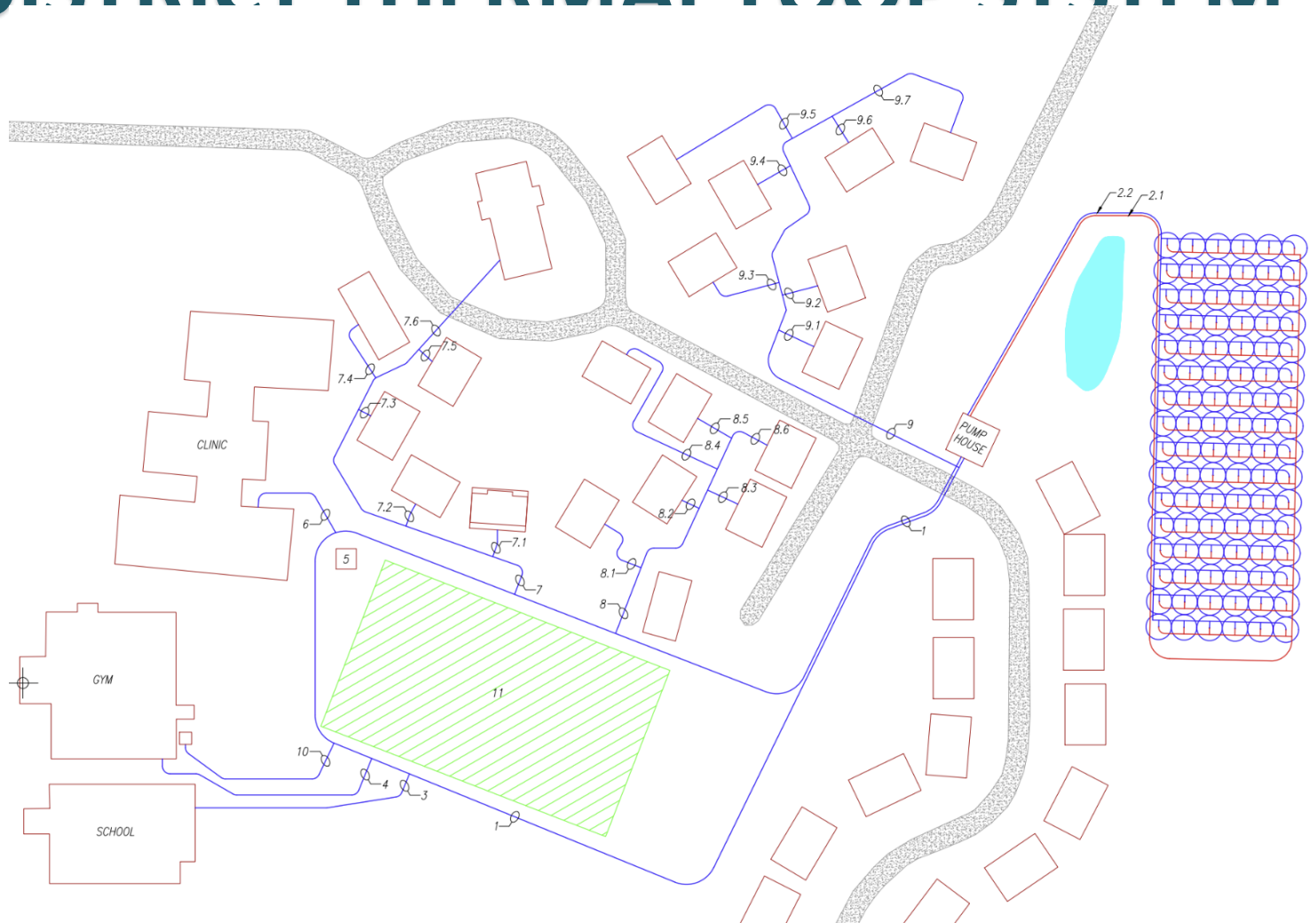
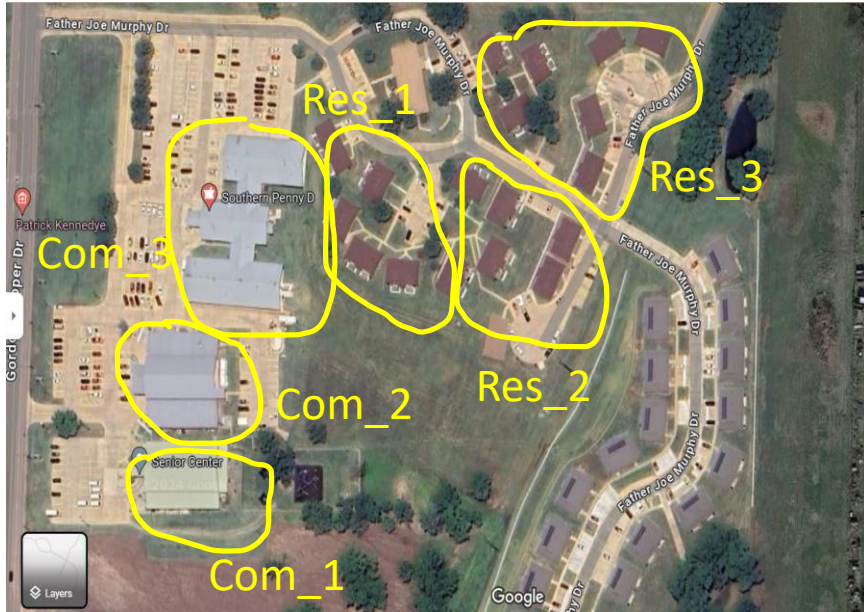




# AGENDA

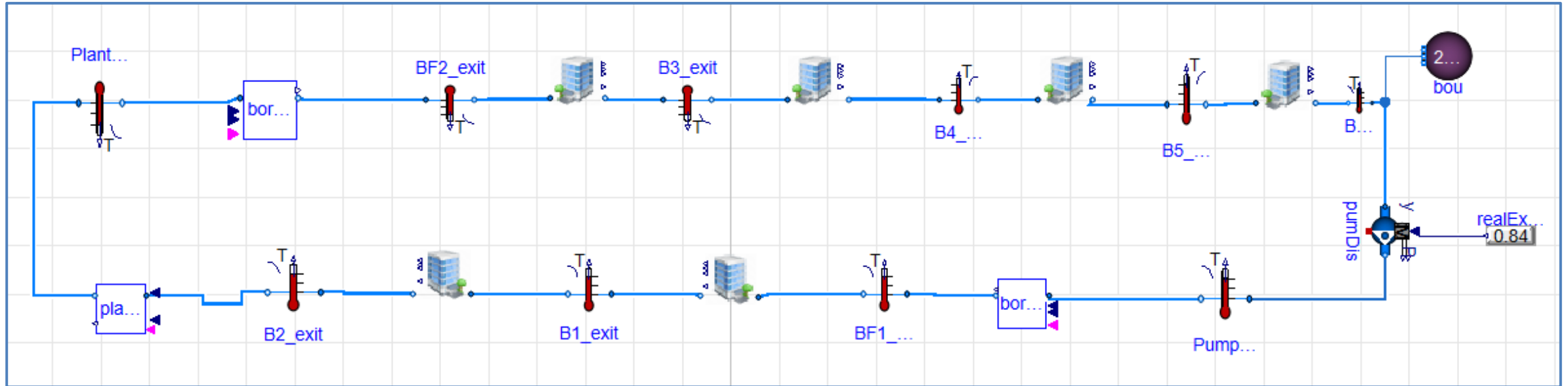
- 5<sup>th</sup> Generation District Thermal loop system
- Simulation Based Design and Operation Analysis
- Annual Results
- Future Opportunities

# 5<sup>TH</sup> GENERATION DISTRICT THERMAL LOOP SYSTEM



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August 21–22, 2024 Houston, TX

# SIMULATION BASED DESIGN and OPERATION ANALYSIS



- **Modelica model** uses a layered approach consisting of the distribution loop, building connection, and heat exchanger levels
- Space heating, cooling, and domestic hot water loads are imported from **Energy-Plus models**
- Simulations run over the course of a year using typical weather data (TMY3)

# ANNUAL RESULTS

## Pumping Control Strategies

- Constant Speed
- Combination Constant and Variable Speed
- Variable Speed – Pressure and Temperature
- Variable Speed - Temperature

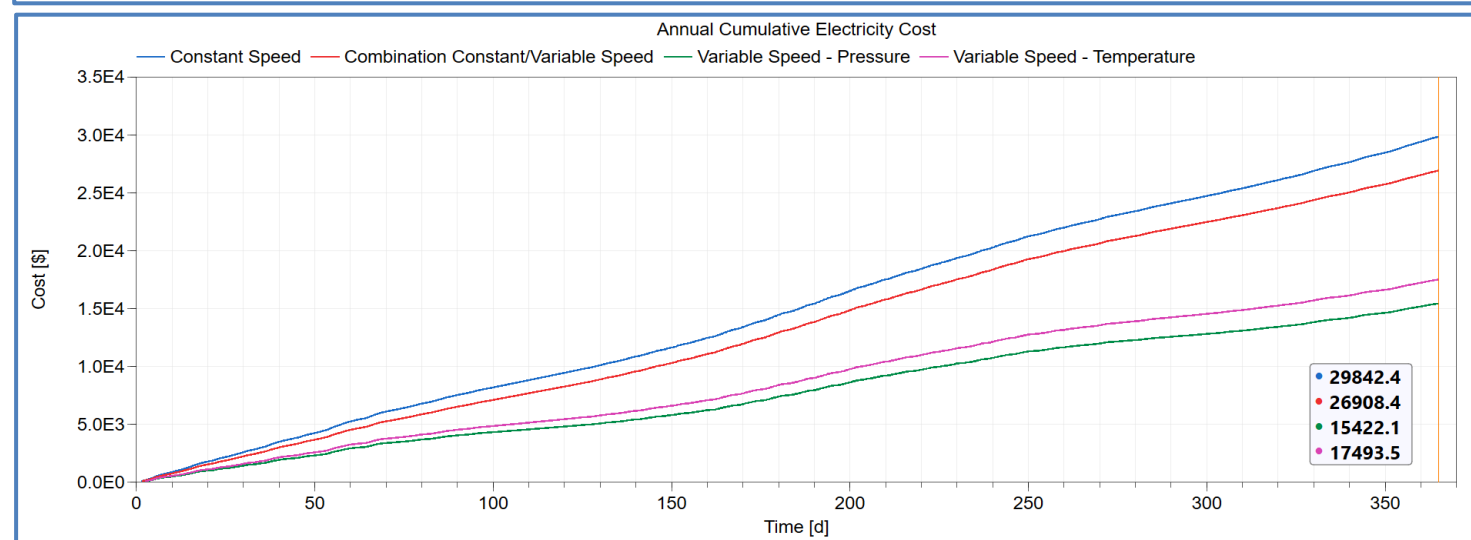
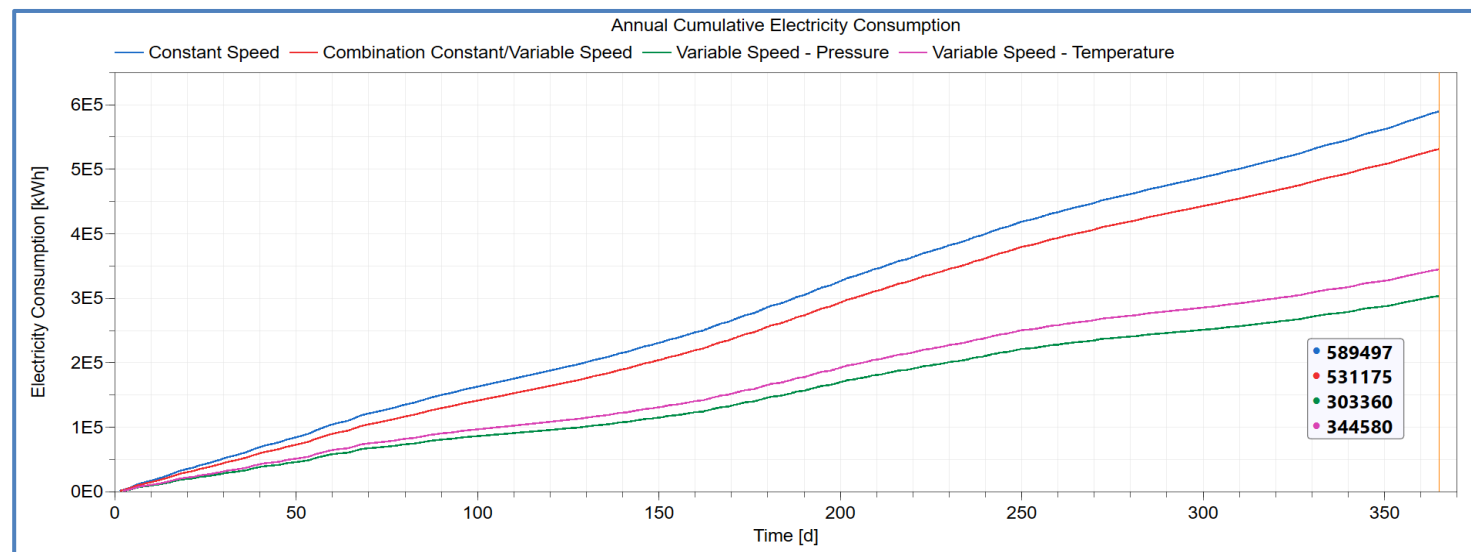
## Highlights

Constant Speed

- 589,500 kWh

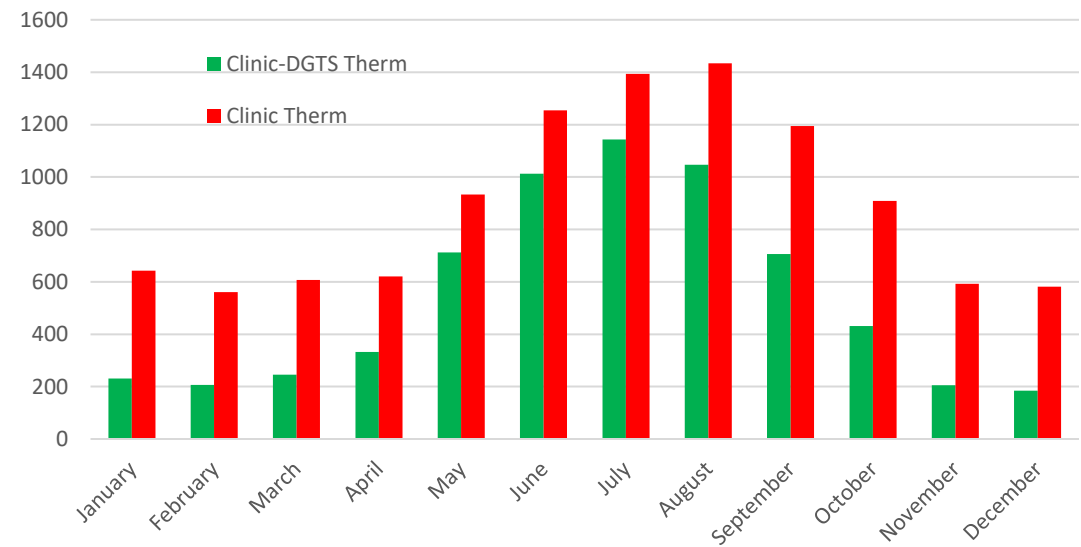
Variable Speed – Pressure and Temperature

- 344,700 kWh

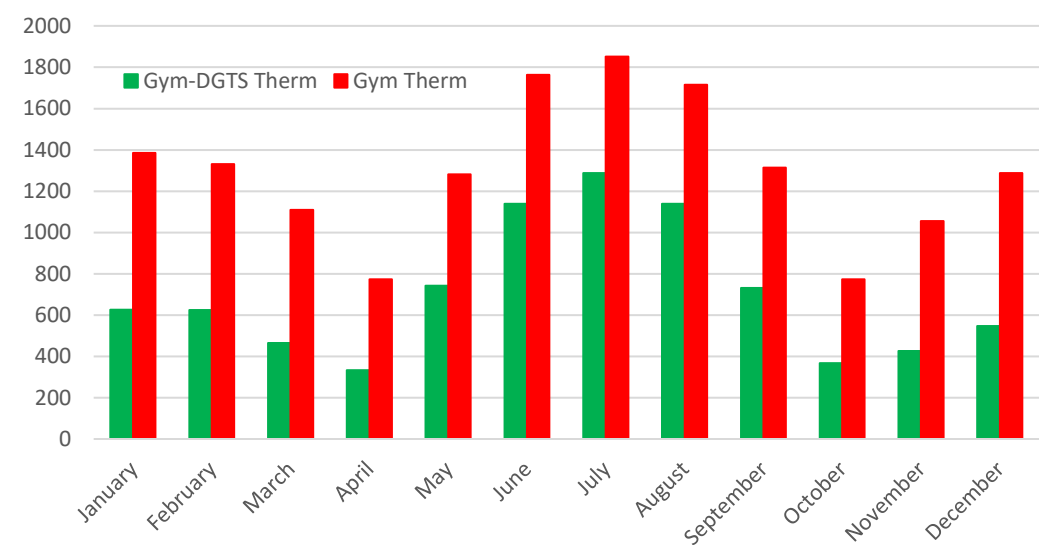


# COMPARISON WITH THE BASELINE

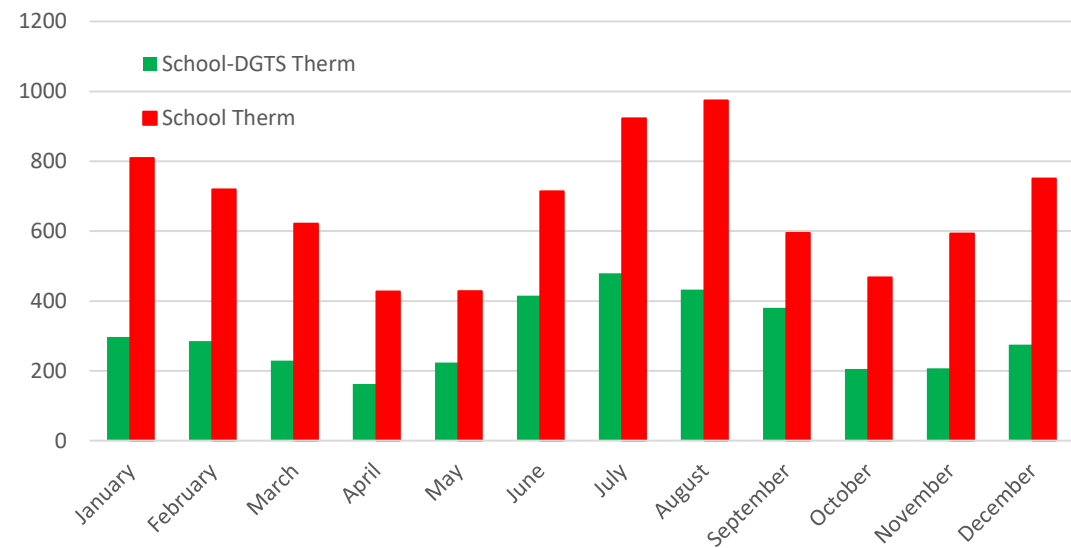
Clinic



Gym



School





**OPEN DISCUSSION**

**LESSONS LEARNS**

**CURRENT OPERATIONAL UPDATES**

**FUTURE OPPORTUNITIES**

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# THANK YOU

Tinker Air Force Base (AFB)  
Oklahoma Gas & Electric  
Honeywell (ESCO Partner)  
University of Oklahoma  
University of Miami



**OG&E**

**Honeywell**



(Joey Hunter [joey.hunter@us.af.mil](mailto:joey.hunter@us.af.mil))

(Michelle Rodriguez-Pico [rodrigmc@oge.com](mailto:rodrigmc@oge.com))

(Kevin Johnson [Kevin.Johnson@Honeywell.com](mailto:Kevin.Johnson@Honeywell.com))

(Doctor Song [lsong@ou.edu](mailto:lsong@ou.edu))

(Doctor Wang [g.wang2@miami.edu](mailto:g.wang2@miami.edu))






# CASE STUDY #1

## TECHNICAL SUPPORT

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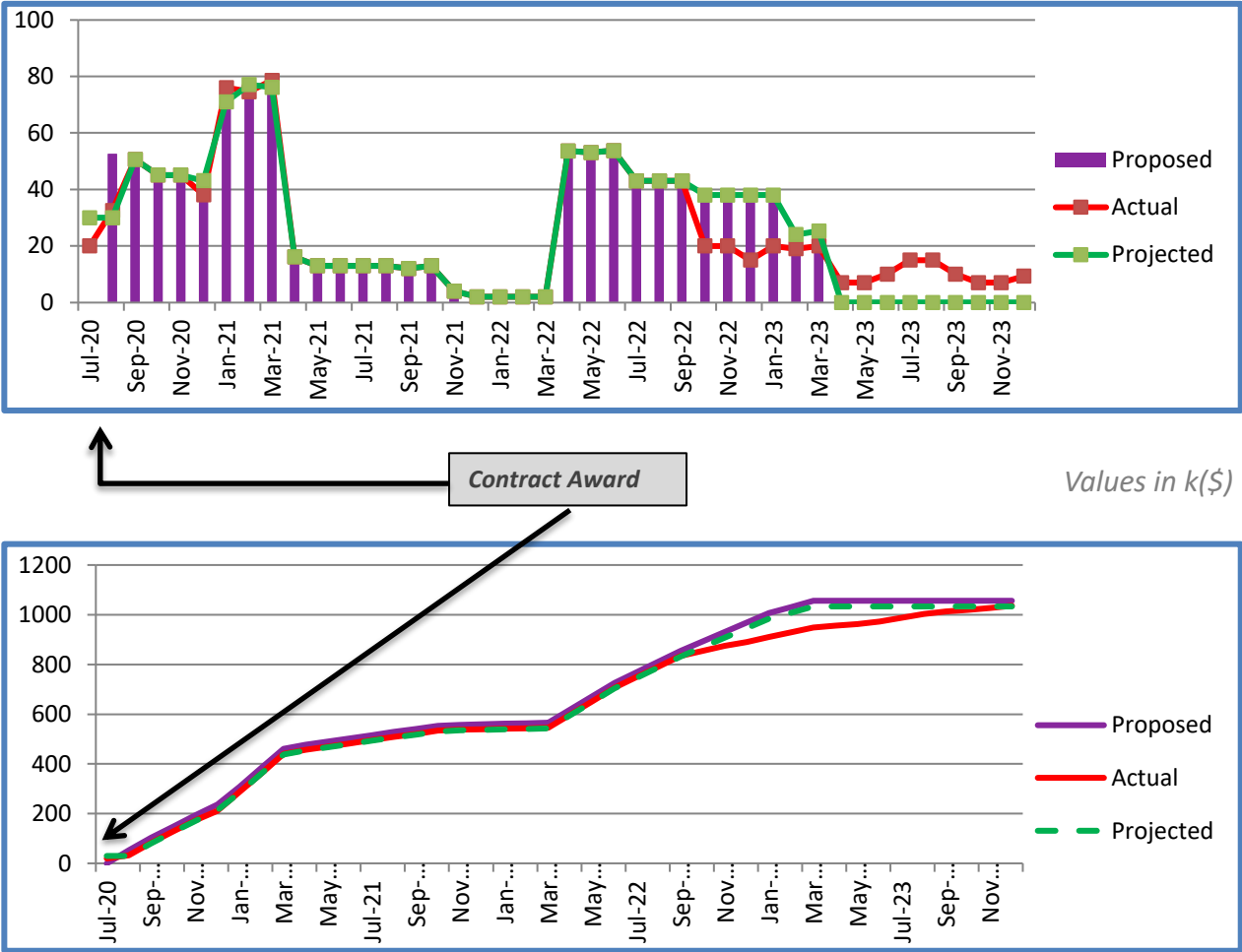
# SCHEDULE OF MILESTONES

Tasks	Year One (7/20 – 3/21)			Year Two (4/21 – 3/22)				Year Three (3/22 – <b>10/23</b> )						Year Four
	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Contingency Year
Demonstration Plan 														
Algorithm Implementation 														
Performance Validation 														
Commercialization Package 														
Final Report 														

- Green – original schedule
- Yellow – adjusted schedule

# PROJECT FUNDING

- Original Planned Start:  
Q2 2020
- Contract Award  
July 2020
- Contract End Date:  
July 2024
- Execution Outlook:  
On Schedule
- Total Contract amount  
\$1,058,060



## Leveraged Project Support

	FY20	FY21	FY22	Task(s) Supported
Tinker AFB – UESC (in \$K)	\$3,240*	\$1,390*	\$0	Controls, sensors & Software Installation
OGE – UESC (in \$K)	\$52**	\$26**	\$17**	Project Management
Honeywell – UESC (in \$K)	\$15**	\$12**	\$10**	Local operating support

\* Direct funding support

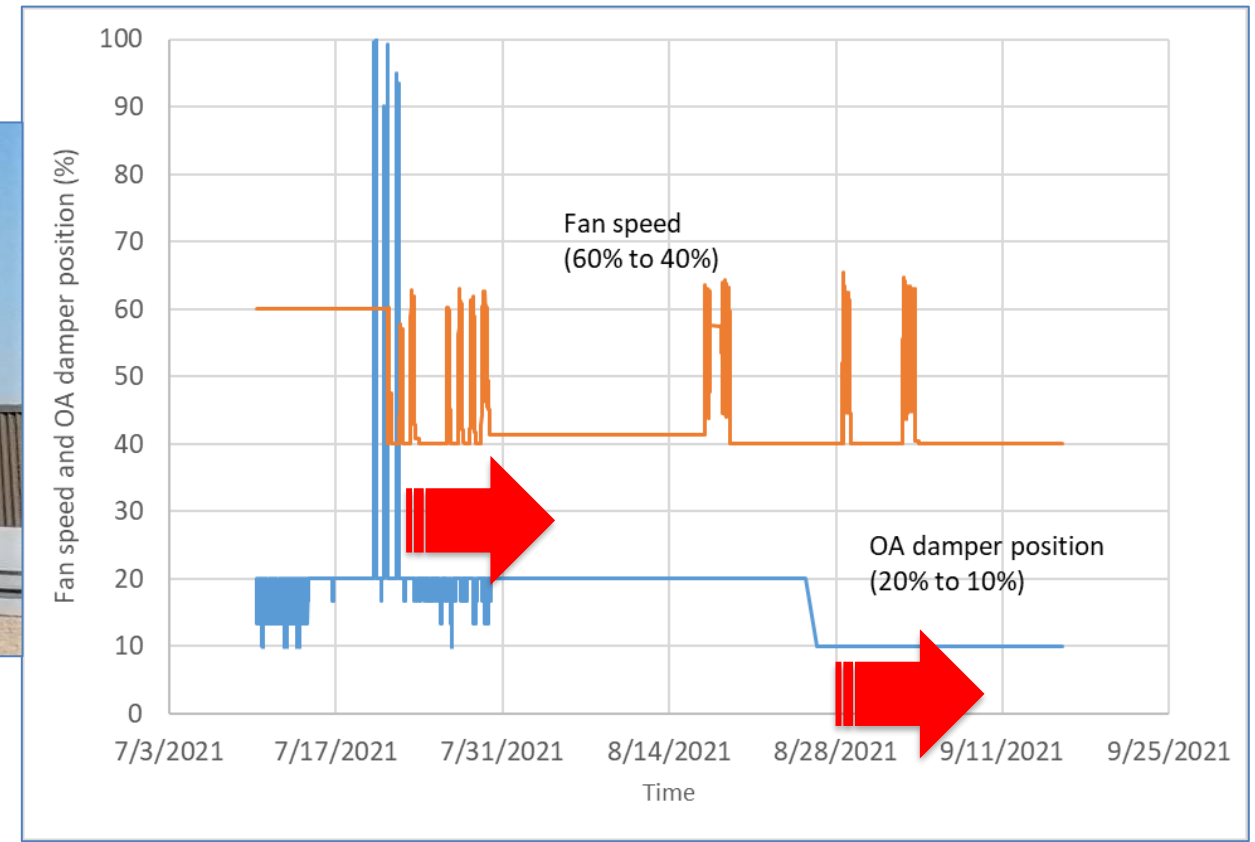
\*\* In-kind support



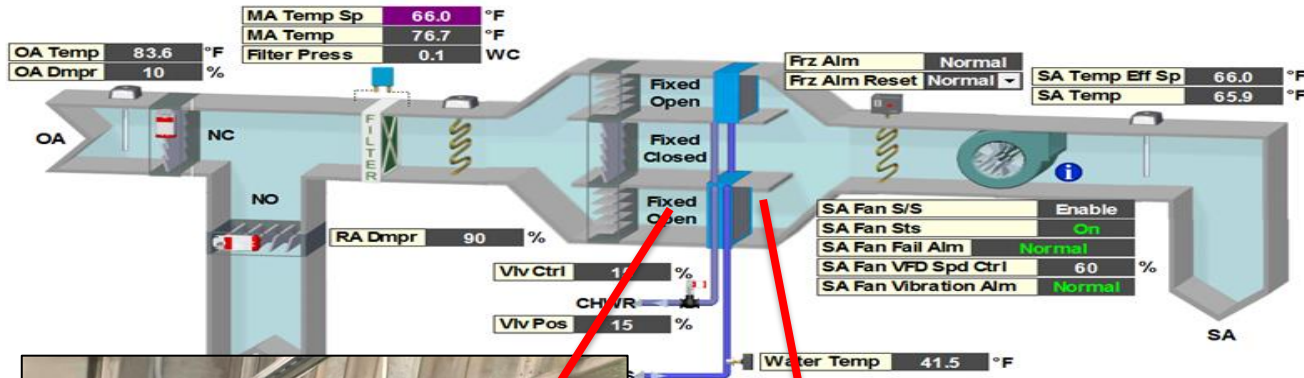
# TEST RESULTS – (PO1)

PO1(OA control at ASH units):  $(0.4 \times 0.1) / (0.6 \times 0.2) = 33\%$

- Reduce OA damper
- Reduce supply airflow



# TEST RESULTS – (PO2)



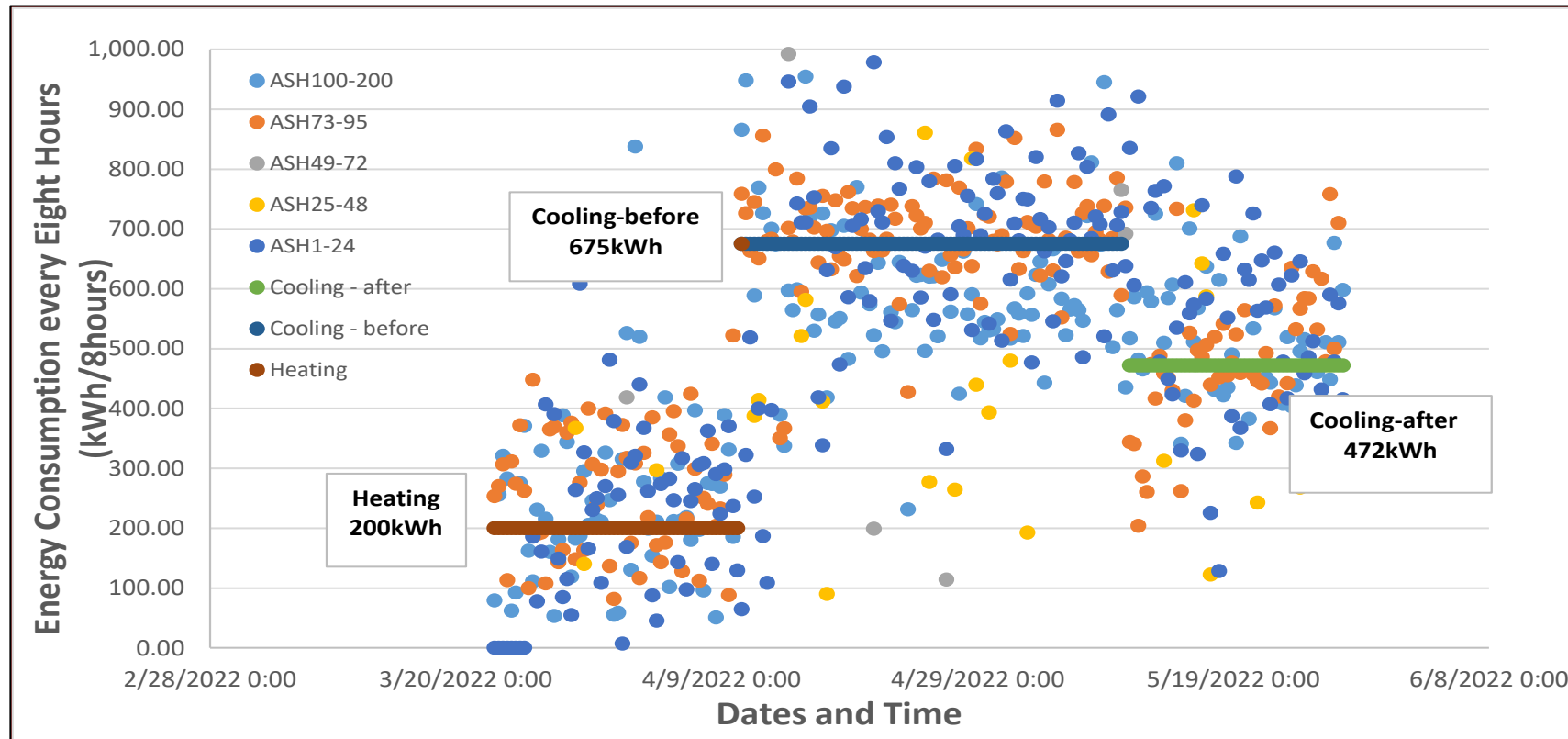
PO2 (Fan speed control at ASH units):

- Original – Reduce min fan speed from 60% to 40%
- Challenge raised by AHU configuration
- Alternative solution – Maintain 60% min speed, but rotate the 26 ASHs off on a schedule

# TEST RESULTS – (PO2)

PO2 (Fan speed control at ASH units):

- Energy baseline collected from last 4 years.
- Collected the fan power from 123 ASH units (30% fan power reduction)



# TEST RESULTS – (PO5 & PO6)

PO5 (Demand Control - DC)

PO6 (DC limited by Room Air Temp):

- Integrated with PO2
- Developed alternating ASHs operation Sch
- Experienced the demand reduction ~200kW
- Enable demand management using return air temperature (comfort index)

Schedule 1-off			Schedule 2-off		
Unit name	Design fan power	Design airflow rate	Unit name	Design fan power	Design airflow rate
ASH3	25	28500	ASH2	25	28500
ASH6	25	28500	ASH5	25	28500
ASH9	25	28500	ASH8	25	28500
ASH12	25	28500	ASH11	25	28500
ASH15	25	28500	ASH14	25	28500
ASH18	25	28500	ASH17	25	28500
ASH21	25	28500	ASH20	25	28500
ASH27	25	28500	ASH28	25	28500
ASH33	25	28500	ASH34	25	28500
ASH36	25	28500	ASH37	25	28500
ASH39	25	28500	ASH40	25	28500
ASH42	25	28500	ASH43	25	28500
ASH45	25	28500	ASH46	25	28500
ASH48	25	28500	ASH49	25	28500
ASH54	25	28500	ASH53	25	28500
ASH57	25	28500	ASH56	25	28500
ASH60	25	28500	ASH59	25	28500
ASH63	40	28500	ASH62	40	28500
ASH66	40	28500	ASH65	40	28500
ASH69	40	28500	ASH68	40	28500
ASH76	40	28500	ASH75	40	28500
ASH79	40	28500	ASH78	40	28500
ASH83	40	28500	ASH81	40	28500
ASH86	40	28500	ASH84	40	28500
ASH87	25	28500	ASH88	25	28500
ASH90	60	60000	ASH89	60	60000
ASH92	60	60000	ASH91	60	60000
ASH106	60	50000	ASH105	60	50000
ASH211	missing	missing	ASH212	25	28500

# CASE STUDY #2

## TECHNICAL SUPPORT

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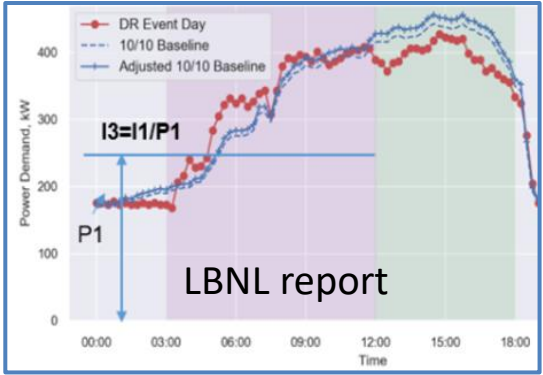
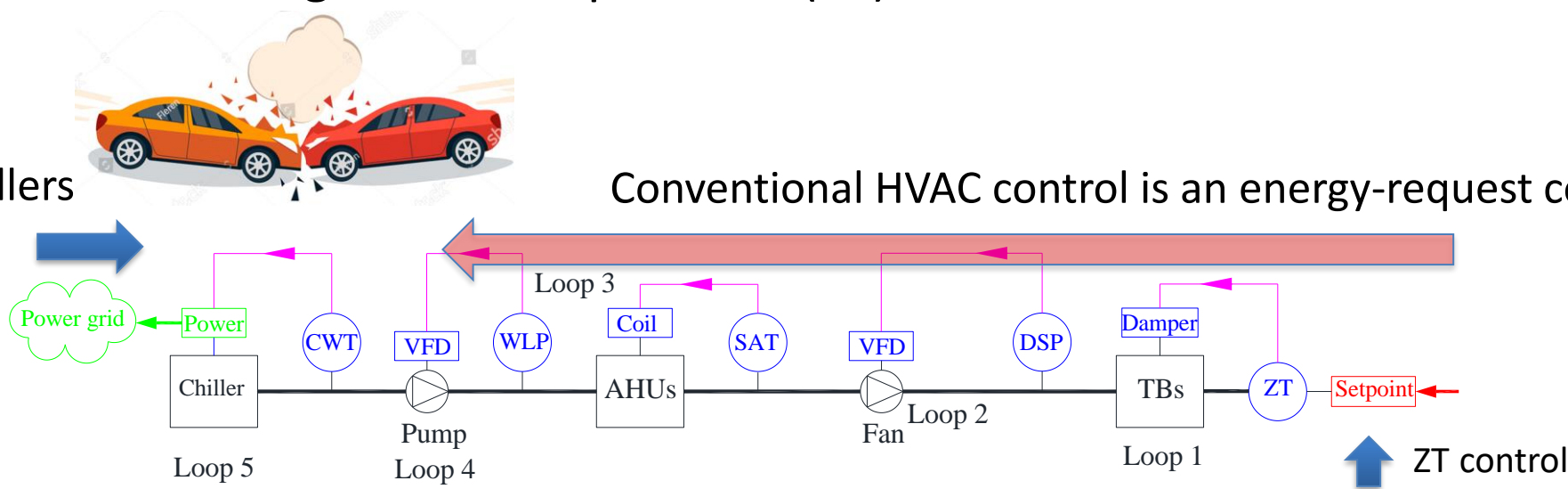




# PROBLEM STATEMENT

- Demand control through zone temperature (ZT) reset

Power control at chillers demands an energy distribution control



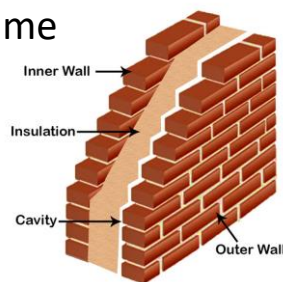
Slow communication

Minutes



Response Time

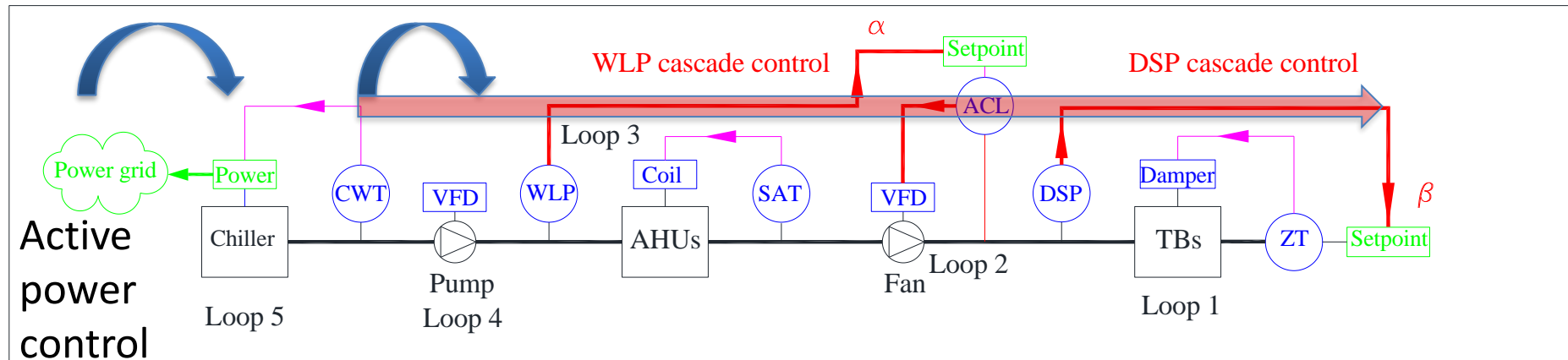
hours



# PROPOSED ENERGY DISTRIBUTION CONTROL

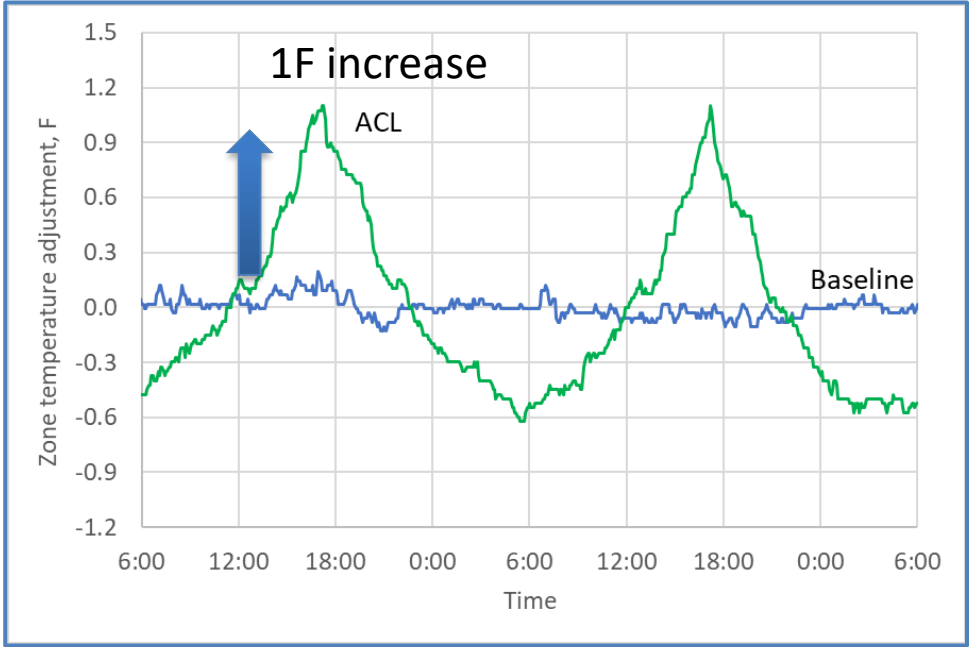
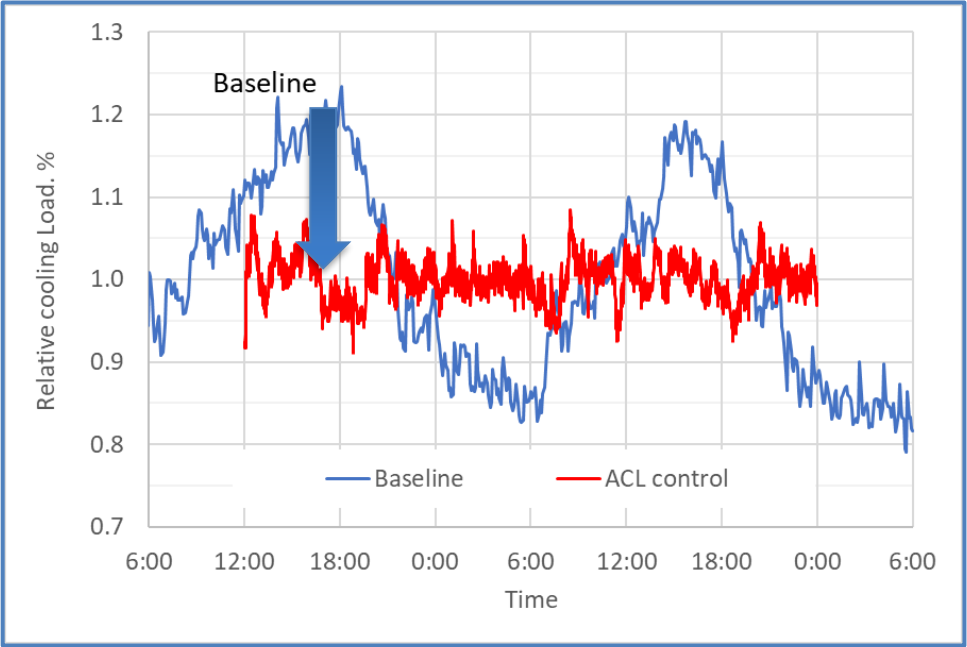
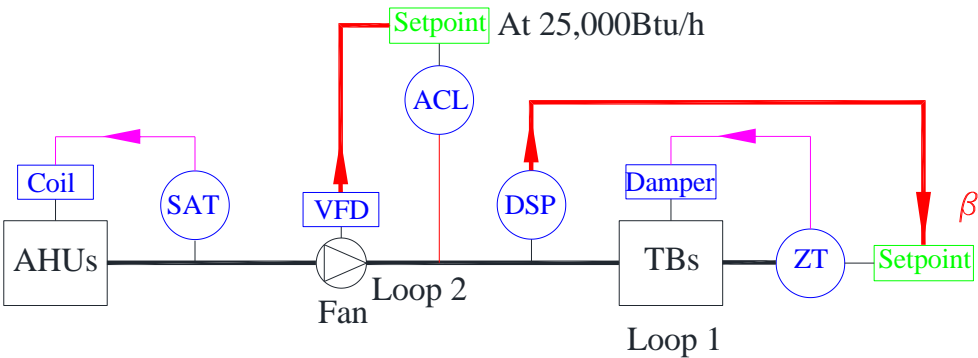
Control loop	Existing	Proposed
➡ Duct static pressure(DSP)	Supply fan	ZT setpoint (cascade)
➡ Cooling load at AHUs(ACL)	None	Supply fan
➡ Water loop pressure (WLP)	CW pump	AHU cooling setpoint (cascade)
➡ CW temperature (CWT)	Chiller power	CW pump

$$CLG_{stp,i} = \alpha CLG_{design,i} \quad 0 \leq \alpha \leq 1 \quad \text{Virtual cooling load meter}$$



# PRELIMINARY RESULTS AT AHUs

#	Control input	Controlled variable
1	ZT setpoint	DSP
2	Fan speed	Cooling load
3	Valve	Supply Air Temp



# GSA Region 7 – Eastern Area CenterPoint UESC

Steve Rutledge, GSA  
Dan Hill, Energy Systems Group  
Nick Kehtel, Energy Systems Group  
Calvin Roberts, CenterPoint Energy

# Project Information

- 18 sites, across 8 cities, in 2 states (TX/LA)
  - Total of 3.894M Gross Square Feet
  - 82 different facilities/structures
- UESC Prime: CenterPoint Energy
- ESCO partner: ESG
- Construction Completion: 2024 (est)



# Project Objectives

CenterPoint Energy (CNP) made every effort to address General Services Administration's (GSA) following goals within this UESC:

- Focus on sustainability, a clean environment, and healthy employees and communities within a financially compelling project
- Save taxpayer money through better management of federal real estate
- Reduce CO2 emissions and assist in compliance with congressional energy reduction mandates and Executive Orders
- Improve occupant comfort through cost-effective ECMs
- Provide building system and infrastructure improvements that give Facilities Managers better operational control of disparate systems
- Reduce energy use intensity and water use intensity
- Implement utility demand response and rebate programs
- Provide grid-interactive efficient building (GEB) technologies

# Solutions Implemented

- Controls Upgrades
- Lighting Upgrades
- Building Envelope Improvements
- Water Conservation
- HVAC Improvements
- Chilled Water Cooling Plant Improvements

# Achievements

- Total Annual Energy Savings: 33,094 Mbtu
- Estimated Annual Carbon Savings: 8.958M lbs/yr
- Estimated Annual \$ Savings: \$1.06M
- Estimated Total Utility Rebates: \$811.8K
- Total Capital Improvement Value: \$19.37M

# Collaborative Highlights

- Developed during the Pandemic - Worked around Covid Hot Spots  
Requiring high level of communication and coordination to minimize disruption to project development
- Unprecedented Inflation and Interest Rate Increases – Project development and award occurring as both of the economic factors peaked; Required laser focus on firm price attainment and timing of award to mitigate risk of ECMs being dropped from the project
- CenterPoint divested of Ng assets in Ok and Ar during development. GSA/CNP team focused on additional procurement mechanisms to salvage the ECM scope in these states, thereby maintaining project value for the GSA.

# ECM 2.0 Cooling Tower / ECM 3.0 Controls Upgrade





# ECM 4.0 AHU Replacement

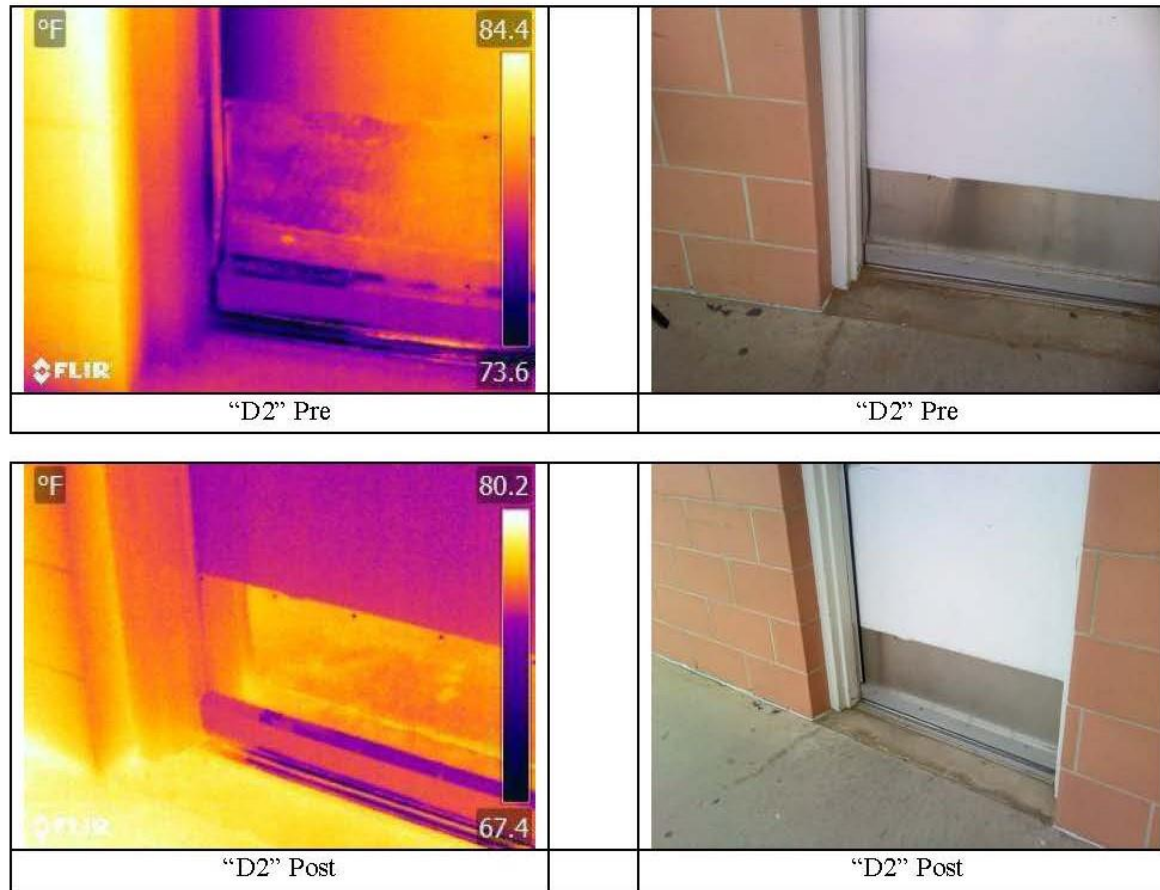




# ECM 5.0 Lighting



# ECM 6.0 Building Envelope





# ECM 13.0 Water Conservation



# FEDERAL UTILITY PARTNERSHIP WORKING GROUP SEMINAR

August 21 – August 22, 2024

## Federal Fleet and Electric Vehicle Supply Equipment (EVSE)

Mark Singer

Sr. Transportation Analyst

NREL





# Electric Vehicles as an Administration Priority

WH.GOV



## Executive Order on Tackling the Climate Crisis at Home and Abroad

January 27, 2021

GSA, Council on Environmental Quality, and Office of Management and Budget in coordination with DOE, Department of Labor, and Department of Commerce to develop a plan to convert Federal, state, local, and Tribal fleets to zero-emission vehicles (ZEVs)



WH.GOV



## Executive Order on Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability

December 8, 2021

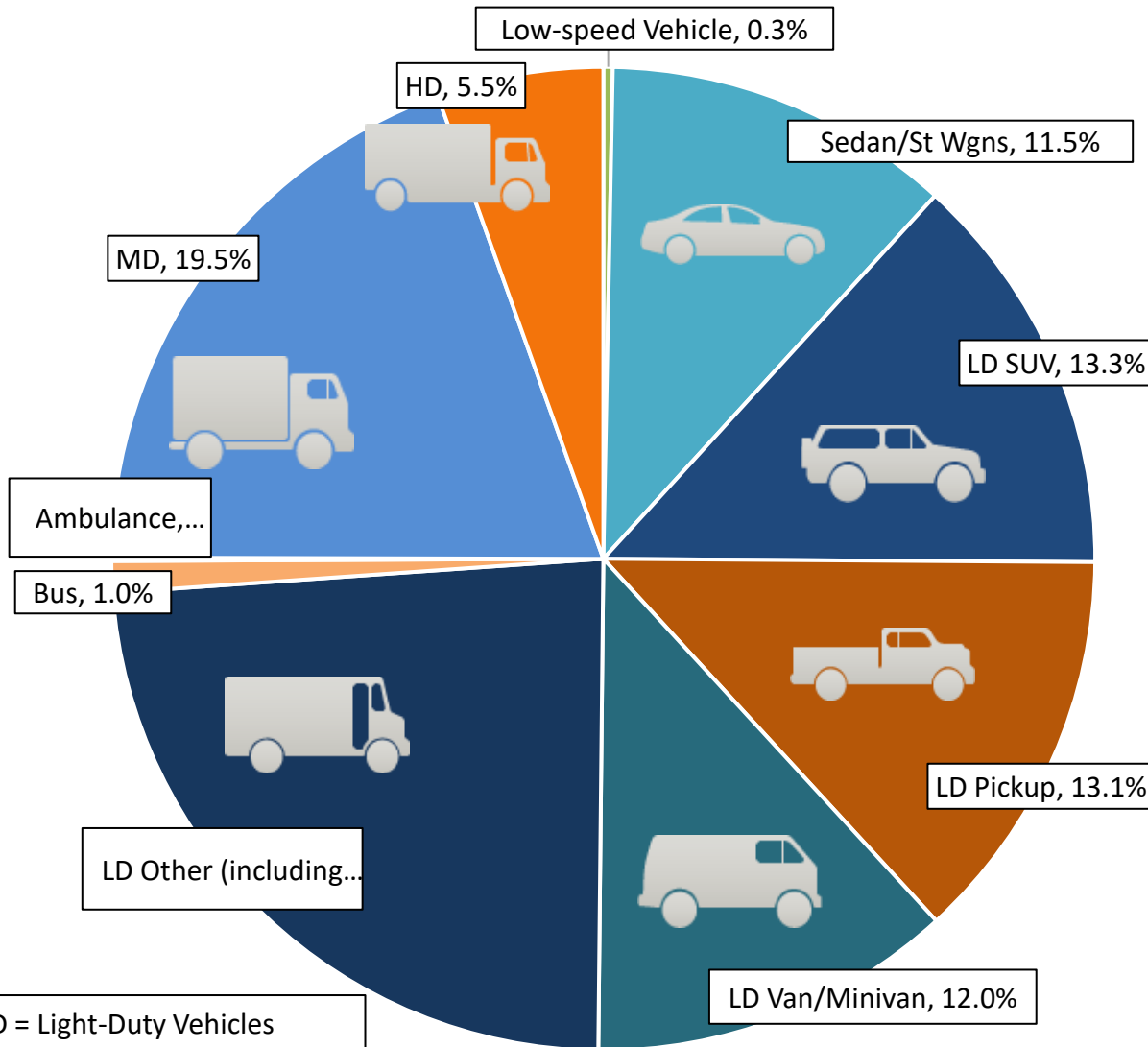
### Transition to a zero-emission federal fleet

- 100% LD acquisitions by 2027
- 100% MD/HD acquisitions by 2035
- Annual agency ZEV strategic plans

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# Federal Fleet Electrification is Accelerating (FY23 FAST)



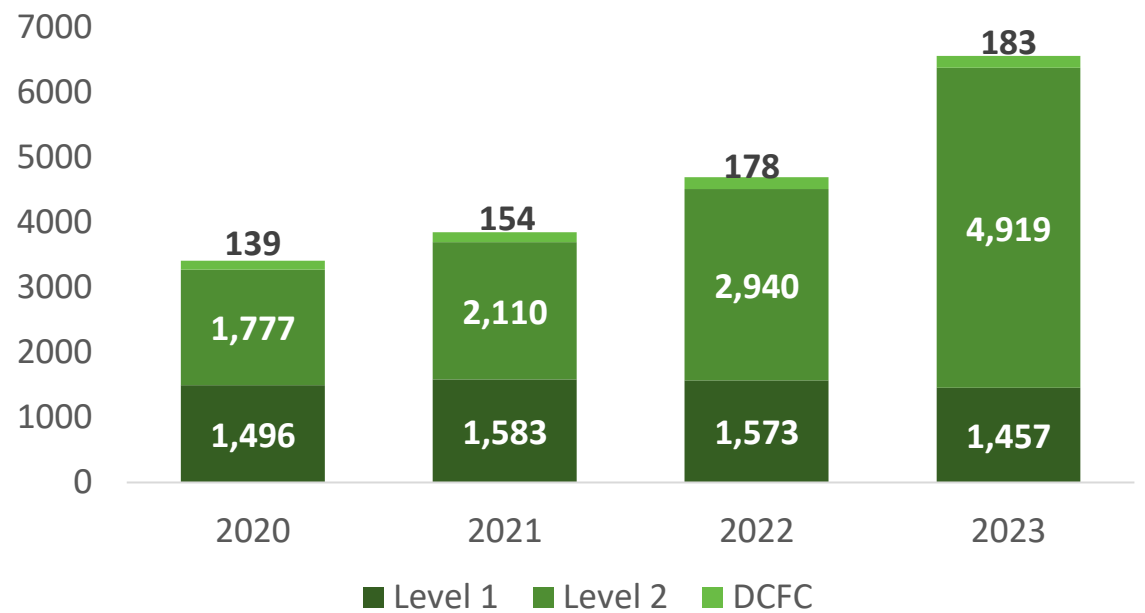
LD = Light-Duty Vehicles  
MD = Medium-Duty Vehicles  
HD = Heavy-Duty Vehicles

3.6k FY22 ZEV orders  
(9% of Federal Fleet Purchases)

5.8k FY23 ZEV orders  
(14% of Federal Fleet Purchases)

5.1k FY24 ZEV orders as of 2/29/24  
(18% of Federal Fleet Purchases)

Source: GSA, Excludes USPS



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# The transition to ZEVs is about more than just vehicles

## Evaluating EVSE impacts on electrical service equipment

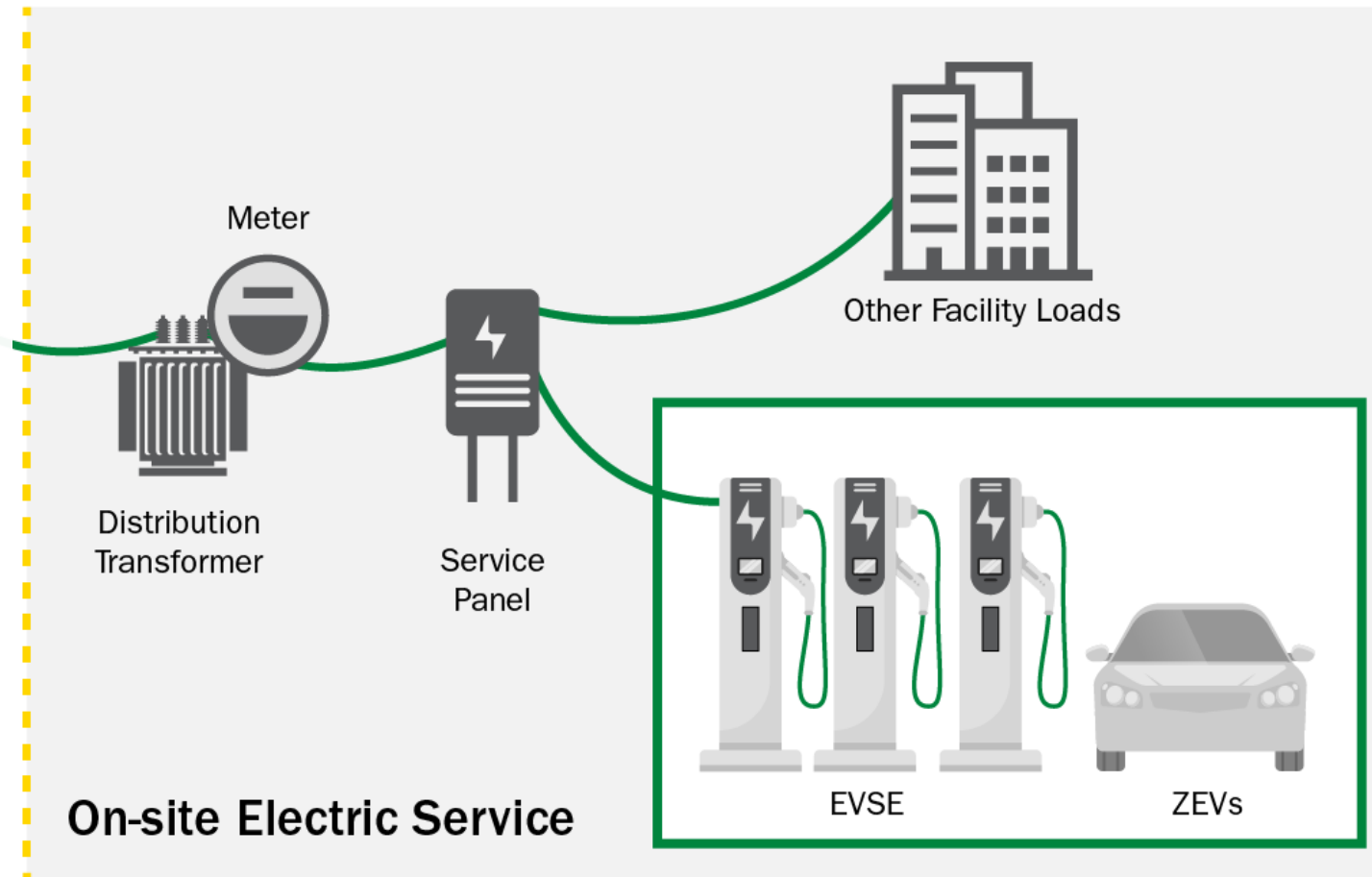
- Facility versus utility equipment ownership

## Evaluating EVSE impacts on power requirements

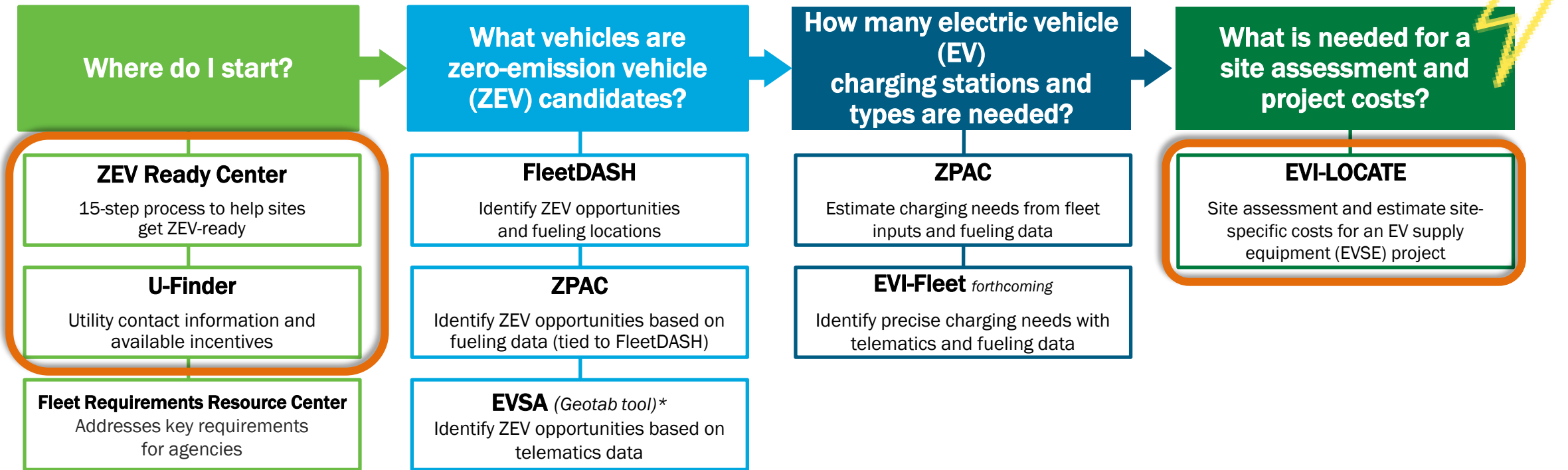
- Power Capacity
- Power Load at the Service Panel Level
- Power Load at the Facility Level

## Utility Equipment Upgrades

- Plan for the future
- Scale back when practical
- Use managed charging



# Federal Fleet Tools



Who should take the lead on using the tool?



Source: <https://www.energy.gov/femp/overview-zev-ready-federal-fleet-electrification-process>

Federal Fleet Email: [federal.fleets@nrel.gov](mailto:federal.fleets@nrel.gov)

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# Federal Fleet ZEV Ready Center

Centralized access to  
**electrification resources**

**Integrates with** web-based  
guidance targeted to each  
stakeholder's needs



**Federal Fleet ZEV Ready Center**

Federal Energy Management Program

Federal Energy Management Program » Facility & Fleet Optimization » Fleet Electrification & Optimization » Electric Vehicles » Federal Fleet ZEV Ready Center

The Federal Energy Management Program's (FEMP's) Federal Fleet ZEV Ready Center provides a process and guide to help federal fleet and facility managers select and acquire zero-emission vehicles (ZEVs) and electric vehicle supply equipment (EVSE)—or electric vehicle (EV) charging stations—for their fleet.

**Overview of the ZEV Ready Fed Fleet Electrification Process**  
LEARN MORE

**ZEV Ready Designation Steps**  
LEARN MORE

Download the **ZEV Ready Tracker** and email **Federal Fleets** to begin the ZEV Ready designation process.

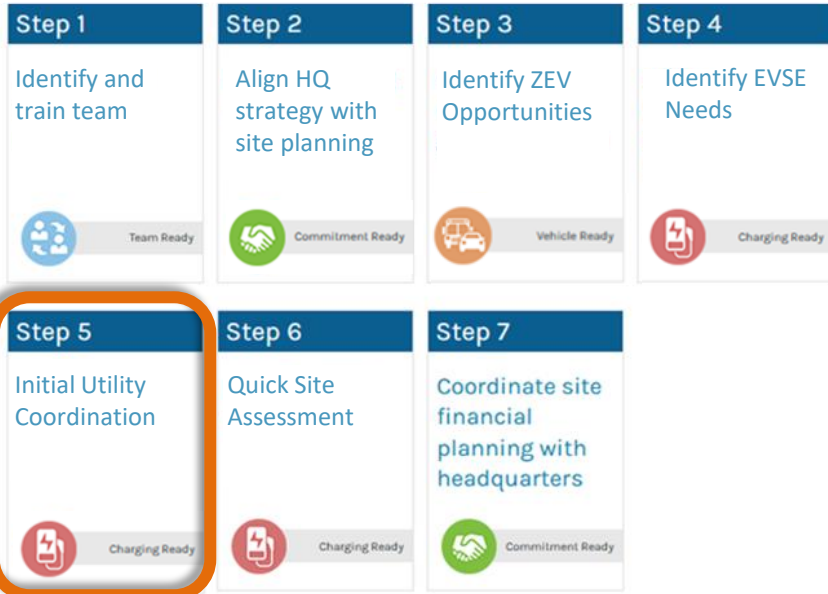
<https://www.energy.gov/femp/federal-fleet-zev-ready-center>



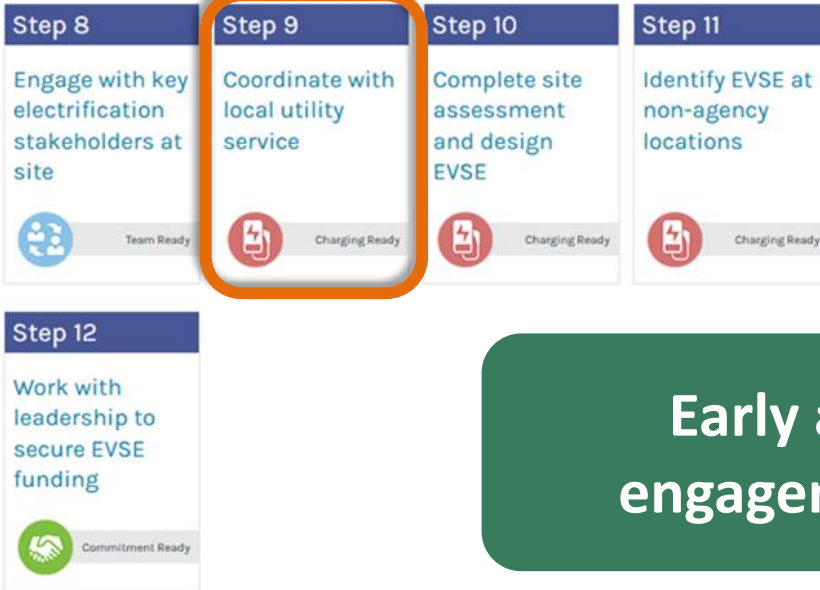
# Federal Fleet ZEV Ready Center

ZEV Ready includes 15 process steps organized in 3 phases – Planning, Design, ZEV Active

## Planning



## Design



## ZEV Active



Early and regular utility engagement is a prioritized

<https://www.energy.gov/femp/overview-zev-ready-federal-fleet-electrification-process>

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# When to work with utilities?



## Planning & Design:

- Planning support?
- Existing load impacts?



## Procure & Install:

- EVSE Incentives?
- Make-ready?



## Manage Charging:

- Rate structure?
- Optimal charging policy?

Throughout EVSE implementation and ZEV expansion

# U-Finder: Connect with your utility

Primary goal: Enable electric vehicle supply equipment (EVSE) planning efforts to connect with local utilities.

Primary message: Contact your utility early in the process!

Secondary goal: Raise awareness of available local utility incentives.


<https://afdc.energy.gov/utility-finder>

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Office of  
ENERGY EFFICIENCY &  
RENEWABLE ENERGY

U-Finder

Utility SearchAbout



### Welcome to the U-Finder


Use the U-finder to search for and find utility partners that can help with the installation of EV chargers.


To begin your search, start by selecting a state or a zip code

☒ State

☐ Zip Code

All States





Joint Office of  
**Energy and  
Transportation**

U-Finder is a resource provided by the [Joint Office of Energy and Transportation](#).

# Joint office Mission and Vision

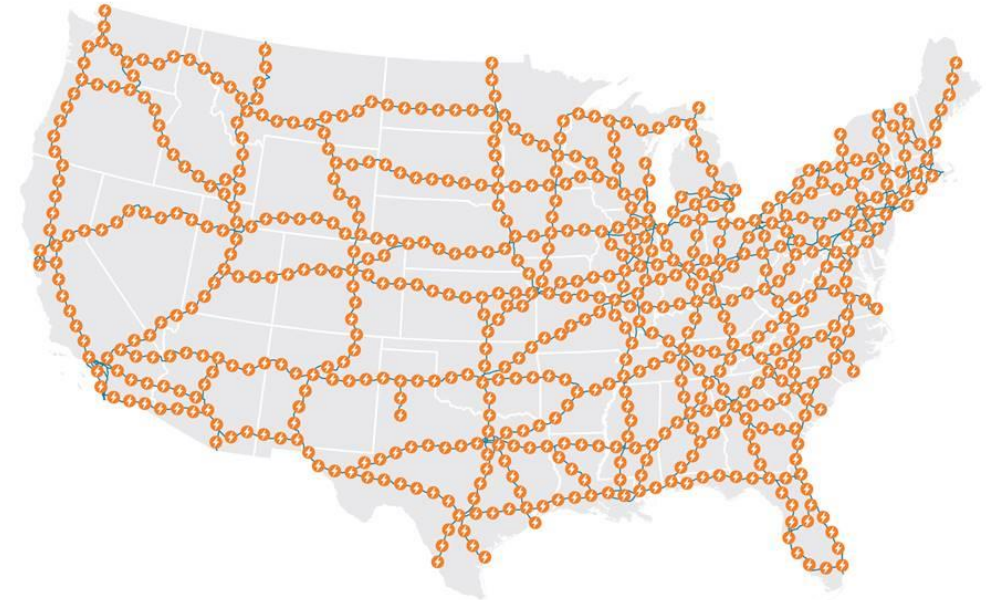
## Mission

To accelerate an electrified transportation system that is **affordable, convenient, equitable, reliable, and safe.**



## Vision

A future where everyone can ride and drive electric.



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# U-Finder Utility Partners and Incentives



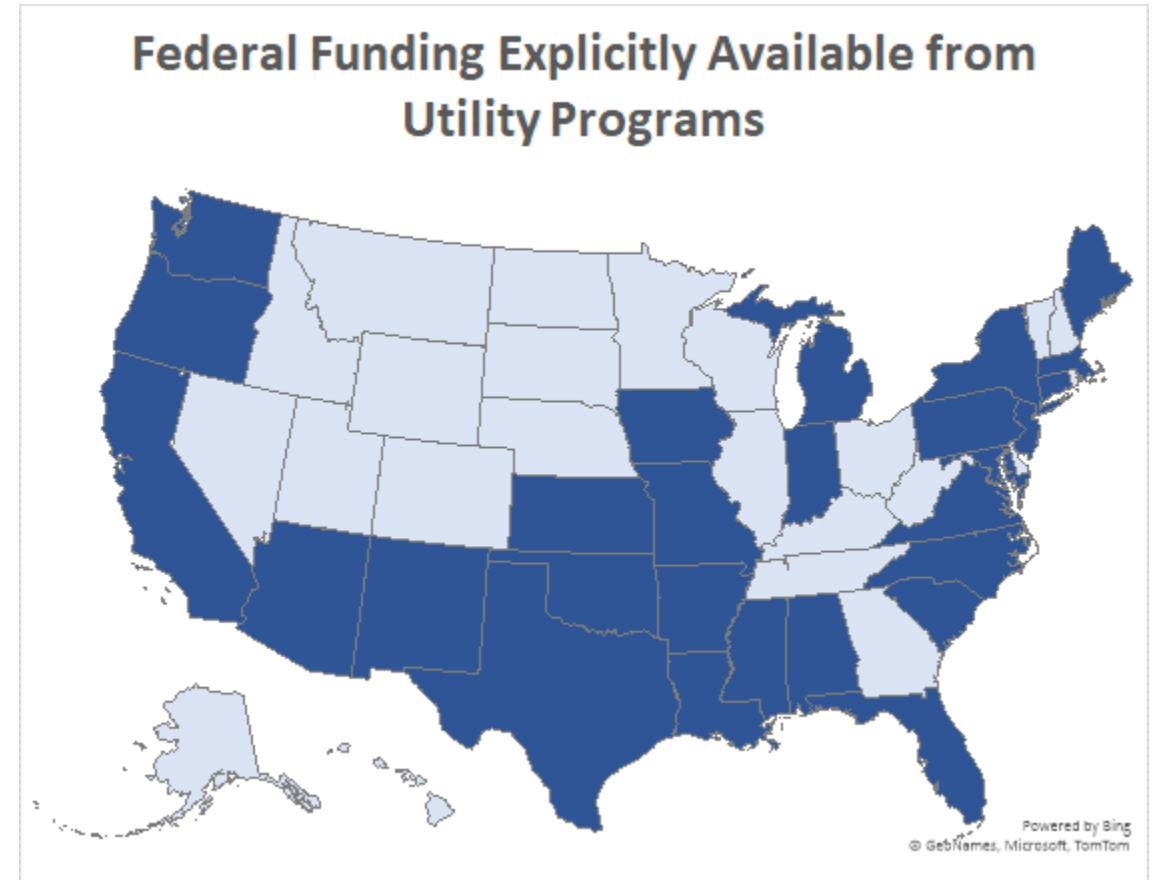
The American Public Power Association ([APPA](#)) represents publicly owned utilities.



The Edison Electric Institute ([EEI](#)) association of investor owned utilities.



The National Rural Electric Cooperative Association ([NRECA](#)) of cooperative member owned utilities.



# U-Finder Resources

- Incentive and Contact information provided by utility partners
- State government incentive information provided by the [Alternative Fuels Data Center Laws and Incentives](#) database
- Clean Cities and Communities Coalition contacts provide local networking opportunity

The screenshot displays the U-Finder web application. At the top, the header includes the ENERGY.GOV logo and the Office of ENERGY EFFICIENCY & RENEWABLE ENERGY. The main navigation bar features 'U-Finder' and tabs for 'Utility Search' and 'About'. Below the header, it indicates 'Current results for Texas'. A filter bar shows 'Texas Utilities' as the selected category, with other options like 'Texas Government Incentives' and 'Clean Cities and Communities'. The search interface includes a 'Utility name' input field with a search icon, a 'Utility Ownership' dropdown set to '3 selected', and a 'Sort by' dropdown set to 'Percent of \$'. The results section highlights 'Oncor Electric Delivery Company LLC', noting it is 'Known as Sempra Energy' and has 'Ownership: Investor (see investor contacts) | Percent of Texas Covered: 31%'. It also lists 'Available EV Charger Funding' for 'Government or Public | Commercial' and provides a link to 'Incentives'. A detailed description of the 'EVolution' program is shown, stating it is an education and outreach program with an R&D study, aimed at helping fleet customers understand utility timelines and costs before electrification. The program's eligibility is listed as 'Commercial, Government or Public'. Action buttons for 'Show Incentives' and 'Show Contact Information' are visible.

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Office of  
ENERGY EFFICIENCY &  
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U-Finder

Utility Search About

Current results for Texas

Texas Utilities Texas Government Incentives Clean Cities and Communities

Utility name Utility name

Utility Ownership 3 selected

Sort by Percent of \$

Oncor Electric Delivery Company LLC

Known as Sempra Energy

Ownership: Investor ([see investor contacts](#)) | Percent of Texas Covered: 31%

Available EV Charger Funding

Government or Public | Commercial

Incentives

[EVolution](#)

EVolution is an education and outreach program with an R&D study embedded in it. The aim is to help inform Fleet customers of utility timelines, costs and other pertinent information before they start their electrification journey.

Eligibility: Commercial, Government or Public



# Utilities: Share your EV point of contact in the U-Finder



The Joint Office of Energy and Transportation created the [U-Finder](#) tool to help prospective EV charging site hosts identify and connect with utilities.

To help site hosts find the appropriate contact, you can provide your utility's EV charging infrastructure contact information to share in the U-Finder.

We recommend a general inbox like *EVHelp@utility.com* to avoid personally identifiable information.

The U-Finder team will review the information and make it available in the tool.

For questions about the U-Finder, contact the [Joint Office of Energy and Transportation](#).

ENERGY.GOV  
Office of ENERGY EFFICIENCY & RENEWABLE ENERGY  
U-Finder

Utility Search About

### Point of Contact for Electric Vehicle Infrastructure Inquiries

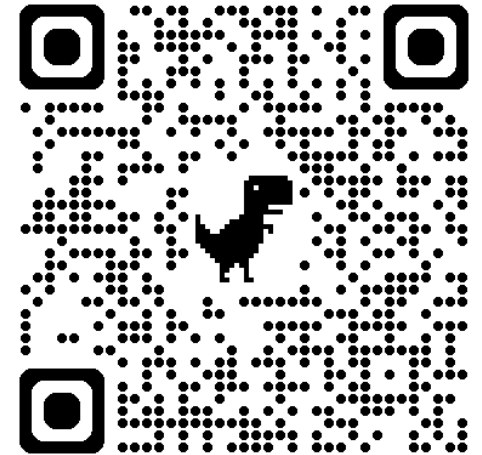
The U-Finder team is collecting contact information to help prospective site hosts, electric vehicle service providers, and customers connect with the right person at their utility when they plan to install electric vehicle (EV) charging equipment. This can help accelerate the engagement process and help utilities reduce time spent routing inquiries.

Use this form to share or update the preferred point of contact for customers installing EV charging equipment. The U-Finder team will review this information before posting it. If you have comments or questions, [contact the Joint Office of Energy and Transportation](#).

**\* Required**

- Utility Name \***  
Enter your answer
- EIA ID**  
Provide the U.S. Energy Information Administration (EIA) ID for the utility. The U-Finder information in the tool. Learn more about EIA IDs at <https://www.eia.gov/electricity/> displayed in the U-Finder tool.  
Enter your answer
- Email \***  
A general email is preferred (example: [EVHelp@utility.com](#)). Avoid personally identifiable information posted in the U-Finder tool.  
Enter your answer
- Website for EV Charging Programs**  
This will be posted in the U-Finder tool if provided.  
Enter your answer

Submit utility  
point of contact:



<https://afdc.energy.gov/utility-finder/contacts>

# EVI-LOCATE (Electric Vehicle Infrastructure–Locally Optimized Charging Assessment Tool and Estimator)

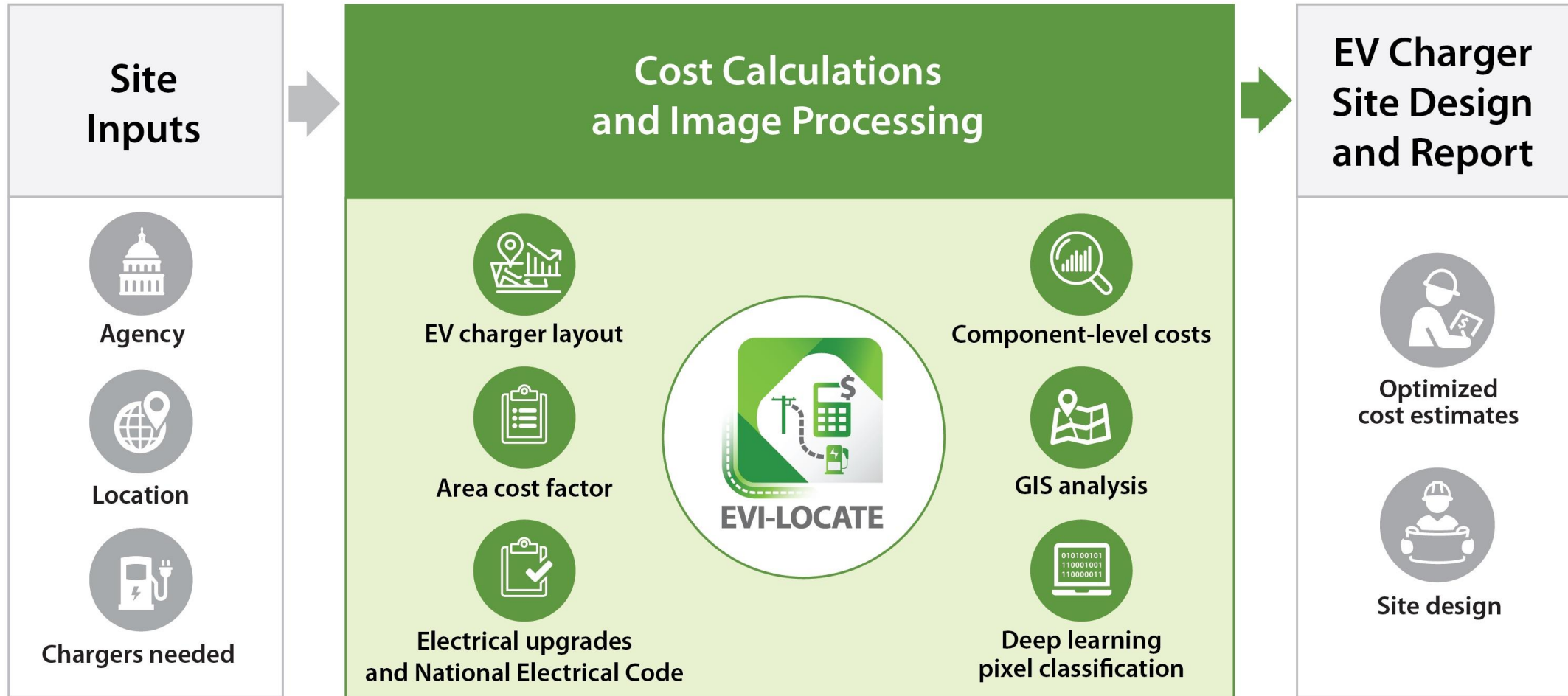
**Objective:** Simplify the EVSE design and cost estimation process with a web tool.

Plan charging  
station  
deployments

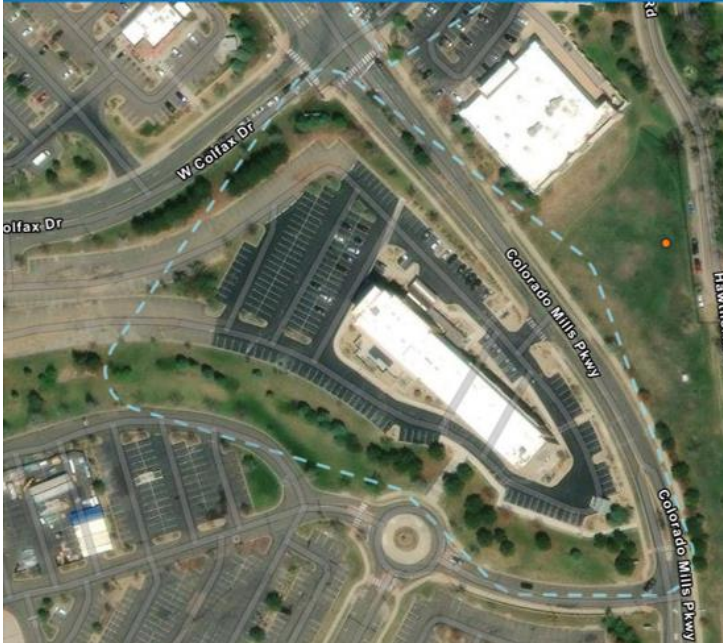
Assess site-  
specific electrical  
needs

Calculate local  
project costs

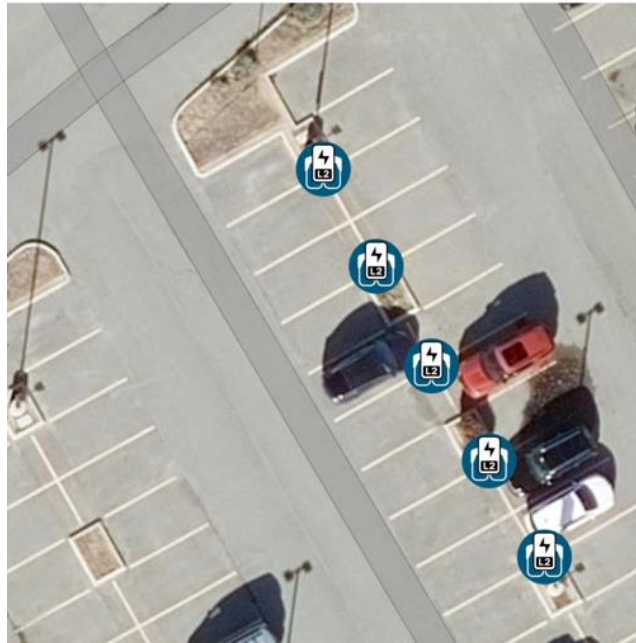
# EVI-LOCATE (Electric Vehicle Infrastructure–Locally Optimized Charging Assessment Tool and Estimator)



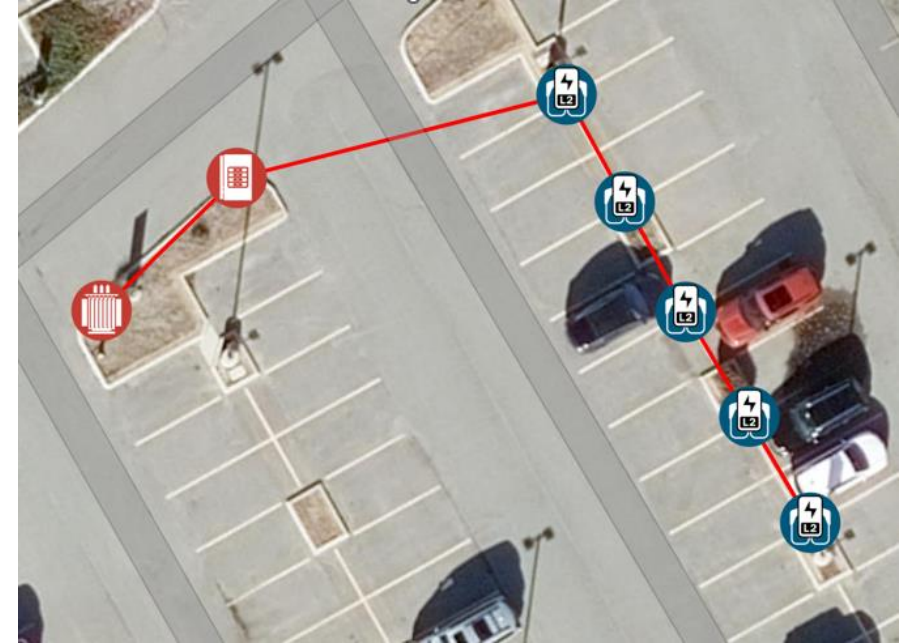
# EVI-LOCATE: Build Your Site Plan



**Define your site  
boundary**



**Plan your charging  
ports**

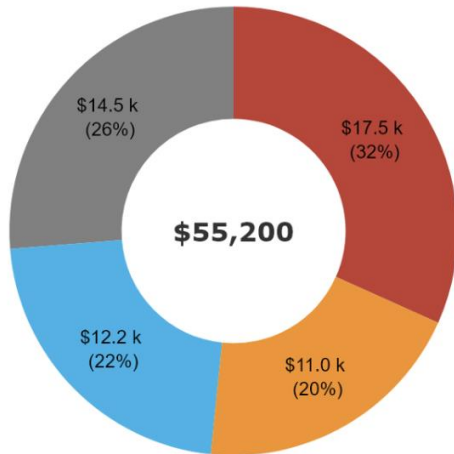


**Define existing  
infrastructure and  
determine wiring run**



# EVI-LOCATE: Detailed Site Plans and Cost Estimates

Estimated Cost of EV Charging Stations Installation

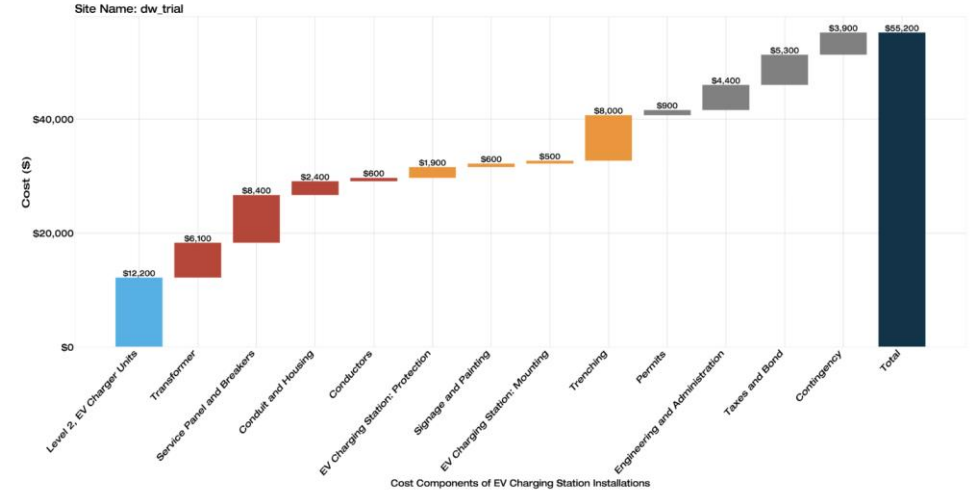


■ Electrical ■ Project Costs  
■ EV Charging Stations ■ Construction



Maxar, Microsoft | Esri Community Maps Contribut... Powered by Esri

Estimated Cost of EV Charging Stations Installation at (Denver in Colorado)



Website: <https://evi-locate.nrel.gov>

Email: [evi-locate@nrel.gov](mailto:evi-locate@nrel.gov)

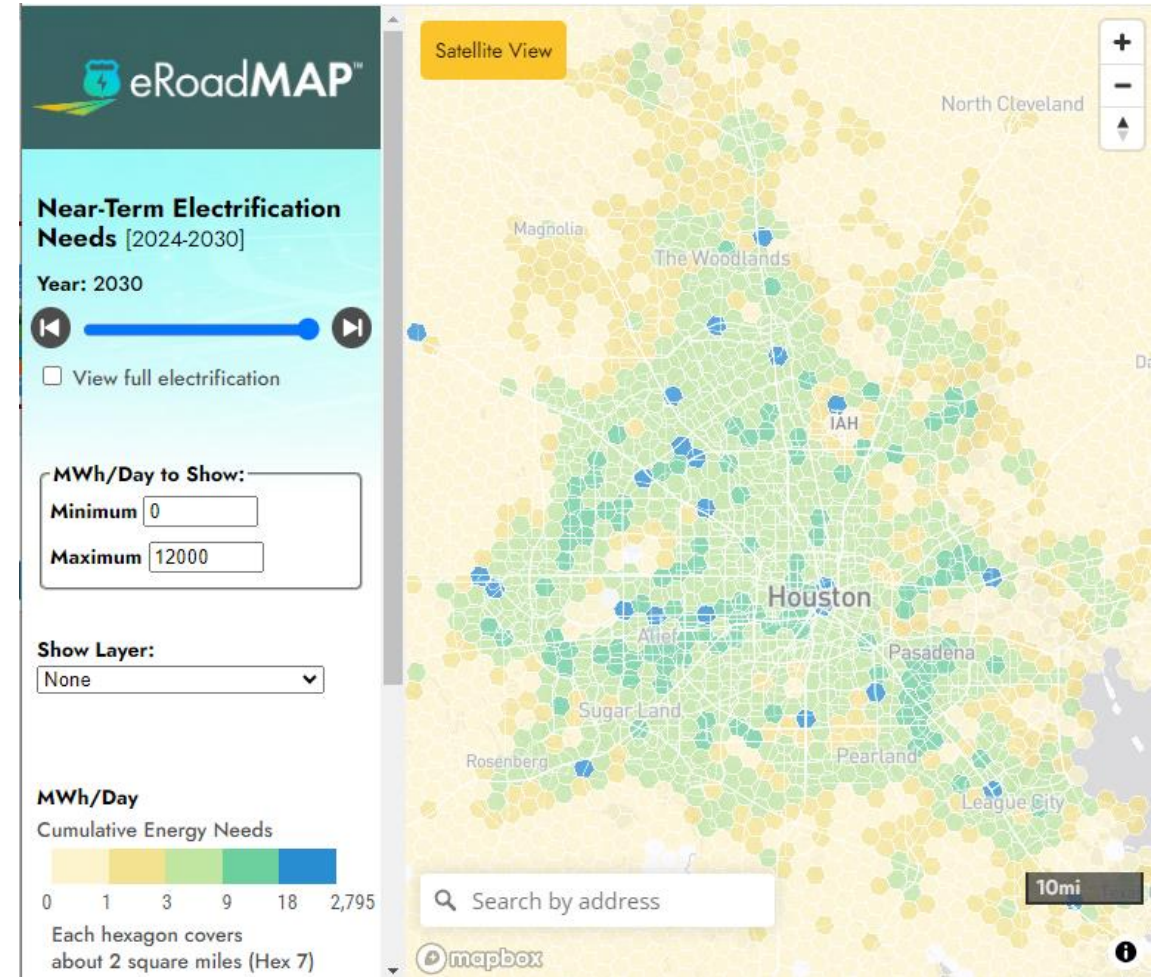
Federal employees can sign up for accounts directly.

Federal contractors email [evi-locate@nrel.gov](mailto:evi-locate@nrel.gov) with federal EVI-LOCATE users CCed.



# NREL is supporting Electric Power Research Institute (EPRI) eRoadMAP

- eRoadMAP is an “online tool for understanding where, when, and how much EV charging load is likely to materialize on the U.S. electric grid.”  
<https://msites.epri.com/evs2scale2030>
- With support the U.S. DOE Vehicle Technologies Office, NREL is modeling potential fleet electricity demands:
  - **Government fleets (Federal, state, and local)**
  - Transit buses
  - Port Cargo Handling Equipment
  - Airport Ground Support Equipment



# Government Fleet Electricity Demand Modeling

## Initial investigation of 100% EV scenario:

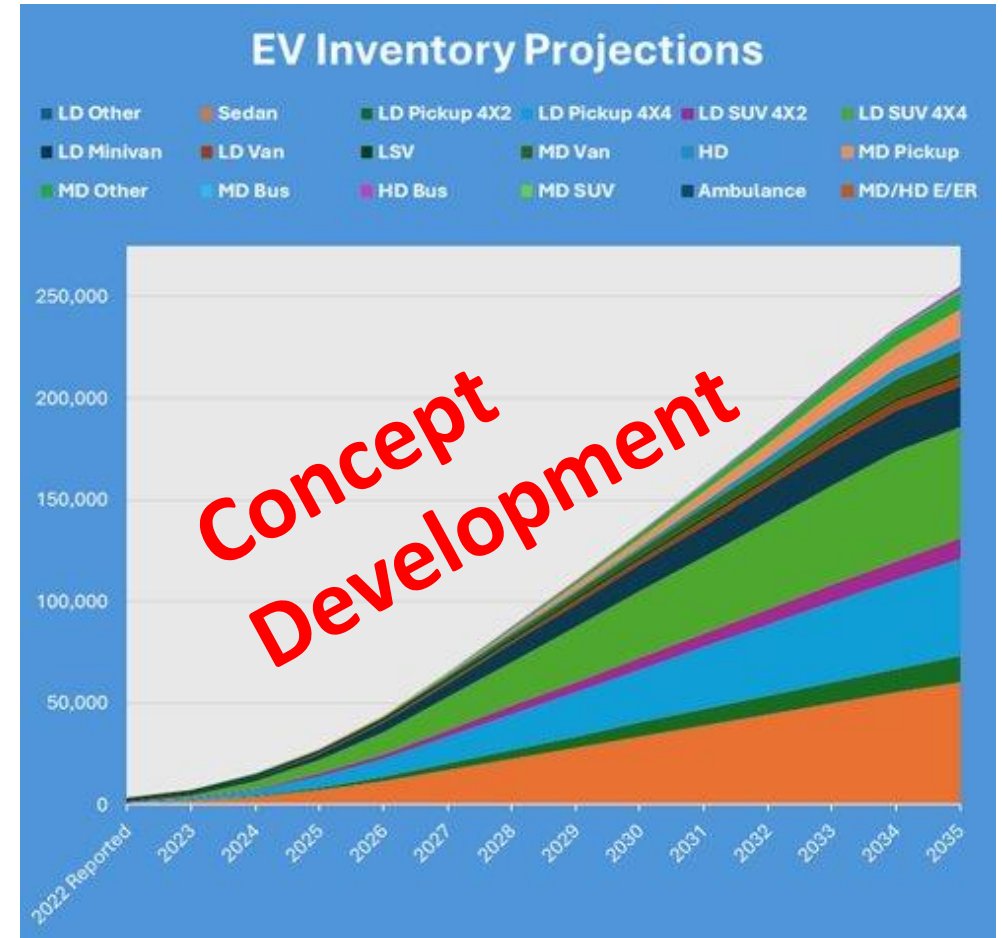
### Assumptions for:

- ZEV efficiency
- Charging power levels
- Charging hourly load profiles by vehicle type

### Primary Inputs:

- Current fleet fuel consumption by vehicle type and location
- Aggregating anonymized data for Federal fleets (fleet manager approved), the Energy Policy Act (EPA) State and Alternative Fuel Provider program, and the Clean Cities and Communities programs

Investigating methods to incorporate volunteered fleet data as available.



# Questions?

**Mark Singer**

Sr Transportation Analyst | Center for Integrated Mobility Sciences

National Renewable Energy Laboratory

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# FEDERAL UTILITY PARTNERSHIP WORKING GROUP SEMINAR

August 21 – August 22, 2024

## Incorporating Advanced Technologies in Performance Contracts

Ken Sandler

General Services Administration (GSA)

Office of Federal High-Performance Green Buildings

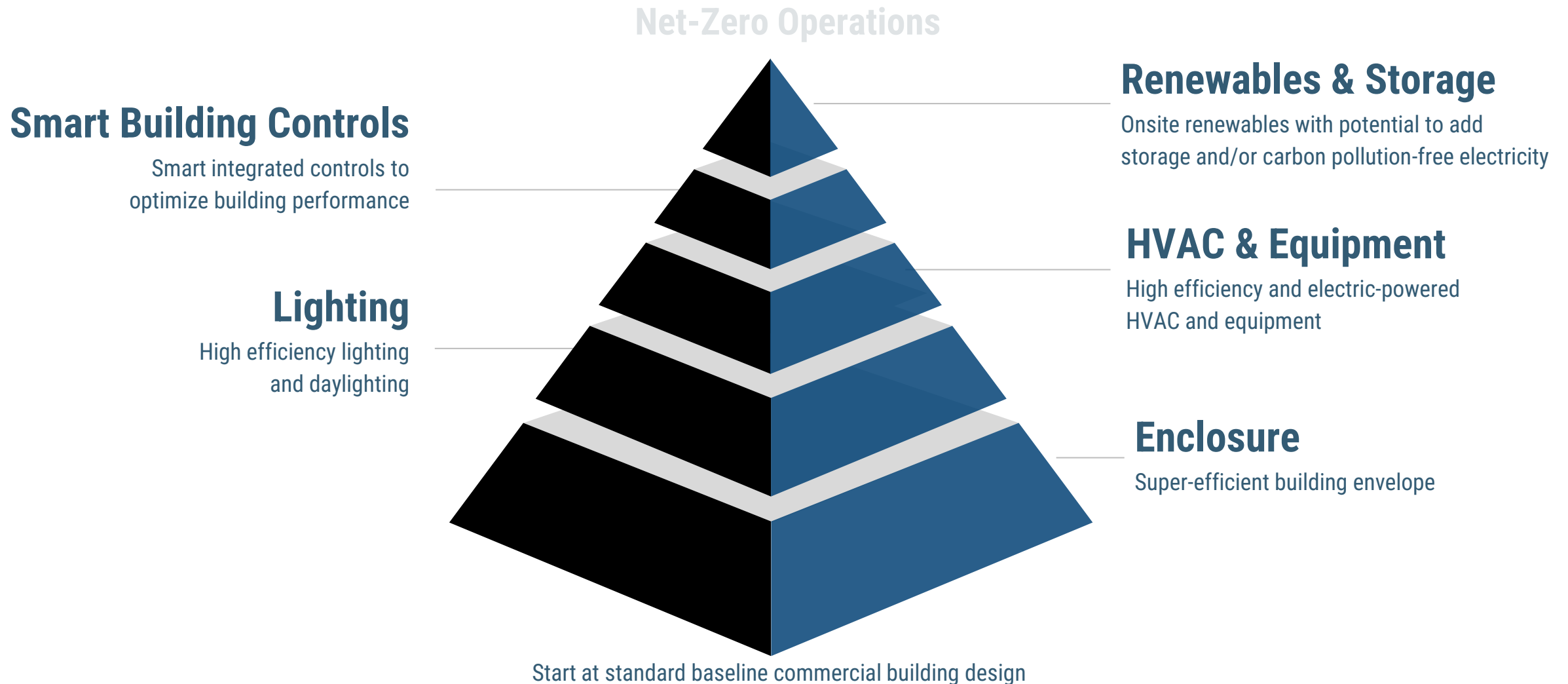


# The Challenge

- Meeting net zero GHG emissions goals requires employing innovative building technologies.
- GSA, DOD and DOE test & verify emerging technologies.
- UESCs & ESPCs are a great foundation but for which we need new approaches to incorporate electrification, etc.
- At GSA Administrator Robin Carnahan's request, we have begun a dialogue with our industry and federal partners.
- What do you see as the barriers and opportunities?



# » Stacking Emerging & Sustainable Technologies



# Technology Verification at GSA

## Center for Emerging Building Technologies

Three programs. One mission. Empowering GSA to invest wisely in next-generation building technologies.



### Green Proving Ground

GPG evaluates the real-world performance of emerging building technologies.



### Pilot to Portfolio

P2P supports deployment of GPG-proven technologies for new construction, retrofits, and end-of-life replacements.



### Applied Innovation Learning Lab

AILL develops a whole-building approach to sustainable operations.

Federal Utility Partnership Working Group  
August 21–22, 2024 Houston, TX



# Green Proving Ground (GPG) Objectives



Identify promising technologies at the edge of commercialization



Test technology installed in GSA's real estate portfolio and evaluate the ease and effectiveness of installation and operation

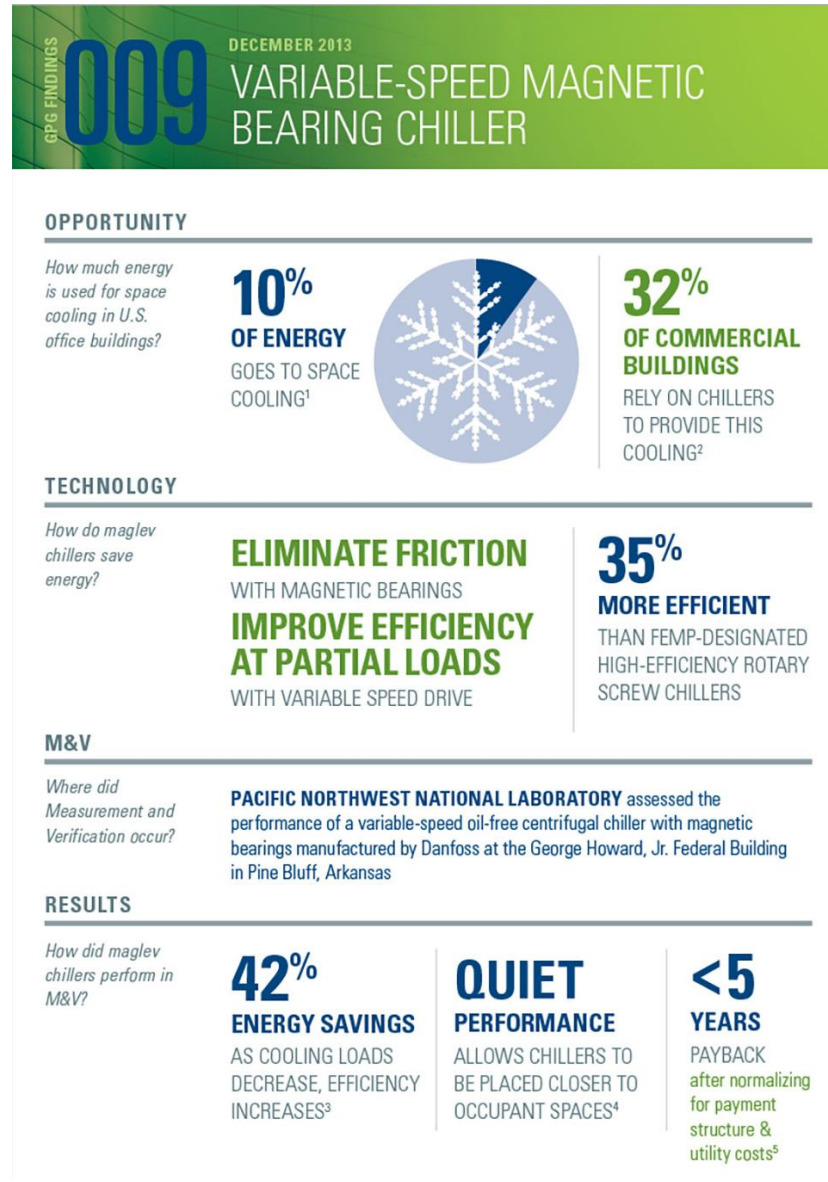


Partner with Department of Energy national laboratories to objectively evaluate real-world performance



Identify technologies with broad deployment potential for GSA, share results with federal and commercial real estate communities

# GPG Technology Assessment Findings



# DoD's Environmental & Energy Technology Programs



## Strategic Environmental Research and Development Program

### SCIENCE AND TECHNOLOGY

- Fundamental research to impact DoD environmental land management
- Advanced technology development to address near-term needs



## Environmental Security Technology Certification Program

### DEMONSTRATION/VALIDATION

- Innovative cost-effective environmental and energy technology demonstrations
- Promote technology implementation by direct insertion and partnering with end users and regulators

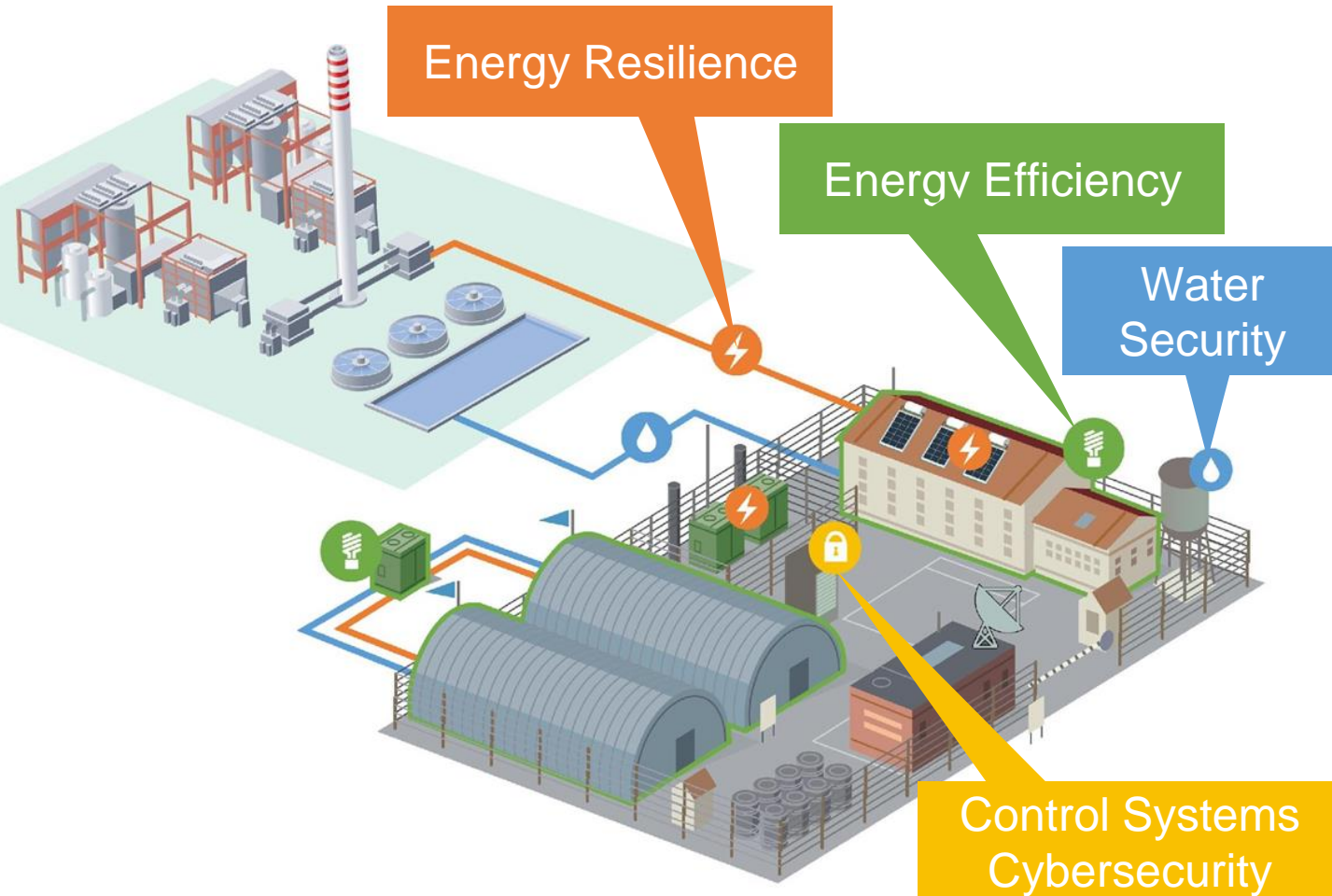


# Supporting the Installation Mission



**Scope:** Improve installation energy and water system resilience, reduce facility-related operational costs and improve building performance to provide safe, healthy and comfortable facilities for our warfighters and civilian staff.

- ◆ **Ensure** critical loads have sufficient, reliable and secure power and water.
- ◆ **Reduce** building and facility operational costs.
- ◆ **Improve** buildings' performance for occupant health, safety, productivity and wellbeing.



# Greenovation Summit at NREL, July 18, 2023

- First of its kind event led by GSA with support from DOE and DoD
- Attended by over 100 participants from:
  - Federal Agencies
  - ESCOs
  - GPG and ESTCP Evaluated Technology Vendors



# Greenovation: Technologies of Focus

Focus groups brainstormed on top barriers to tech deployment and solutions to overcome them, for 8 technology types:

- Solar PV and Battery Energy Storage Systems
- District Thermal Heat Pumps
- Other Commercial Heat Pumps
- Advanced Water-Side HVAC Technologies
- Advanced Air-Side HVAC Technologies
- EVSE and Bidirectional Charging
- Advanced Energy Management Systems
- Windows and Building Envelope





# Barriers to Federally-Validated Technologies

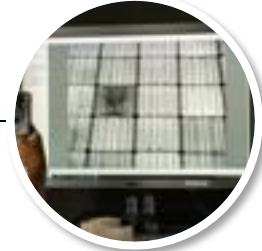
**Cybersecurity  
& ATO**



**Workforce  
Experience**



**Long-Term  
Viability**



**Financial  
Feasibility**



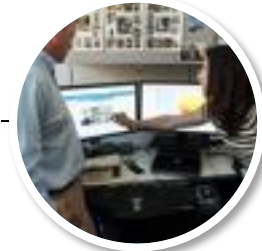
**Performance  
Risk**



**Building/Land  
Restrictions**



**Market  
Risk**



*All images downloaded from NREL's Image Gallery. From left to right: 86015, 68596, 16606, 61267, 46888, 81496, 30453, 85783*

# Mapping Barriers and Owning Solutions

Barrier	Solution	Owner
Startups and other technology vendors lack familiarity with performance contracts	Free training programs on federal performance contracting processes	GSA and DOE develop and promote trainings
ESCOs can be large and are often fragmented so technology knowledge and communication processes can vary	Increased communication across ESCO teams	ESCOs promote sharing between projects
Long-term O&M strategy is often lacking	Develop and agree to long-term O&M strategy up front in contract	ESCO and government/owner



# What Do You Think?

- To advance emerging technology adoption in performance contracts, what new approaches or resources do we need, e.g.:
  - Process changes?
  - Support or services?
  - New business models?
  - Additional information or data?
- What are the appropriate roles for key actors (feds, utilities, ESCOs, etc.) to play?
- Top priority actions?
- What can you offer? What capacities and strengths do you have that can be leveraged?

# For More Information

- **GSA Green Proving Ground:**
  - Kevin Powell, [gpg@gsa.gov](mailto:gpg@gsa.gov)
  - Annual solicitations every summer/fall
  - <https://gsa.gov/gpg>
- **DOD ESTCP:**
  - Tim Tetreault, [timothy.j.tetreault.ctr@mail.mil](mailto:timothy.j.tetreault.ctr@mail.mil)
  - Annual solicitations every January
  - <https://serdp-estcp.mil/>
- **Presenter:**
  - Ken Sandler, PhD, GSA Office of Federal High-Performance Green Buildings, [ken.sandler@gsa.gov](mailto:ken.sandler@gsa.gov), 202-280-9670

# FEDERAL UTILITY PARTNERSHIP WORKING GROUP SEMINAR

August 21 – August 22, 2024

## Thank You for Attending the 2024 FUPWG Seminar!

*The Energy Lawyers and Contracting Officers Forum begins at 1:00PM CT. Open to all FUPWG attendees!*

