

# 88th Air Base Wing

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*“Strength Through Support!”*



## 88 Civil Engineer Group Energy Program Overview

8 Jan 25

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*Disclaimer: The views expressed are those of the author and do not necessarily reflect the official policy or position of the Air Force, Space Force, Department of Defense, or U.S. Government.*

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# Agenda

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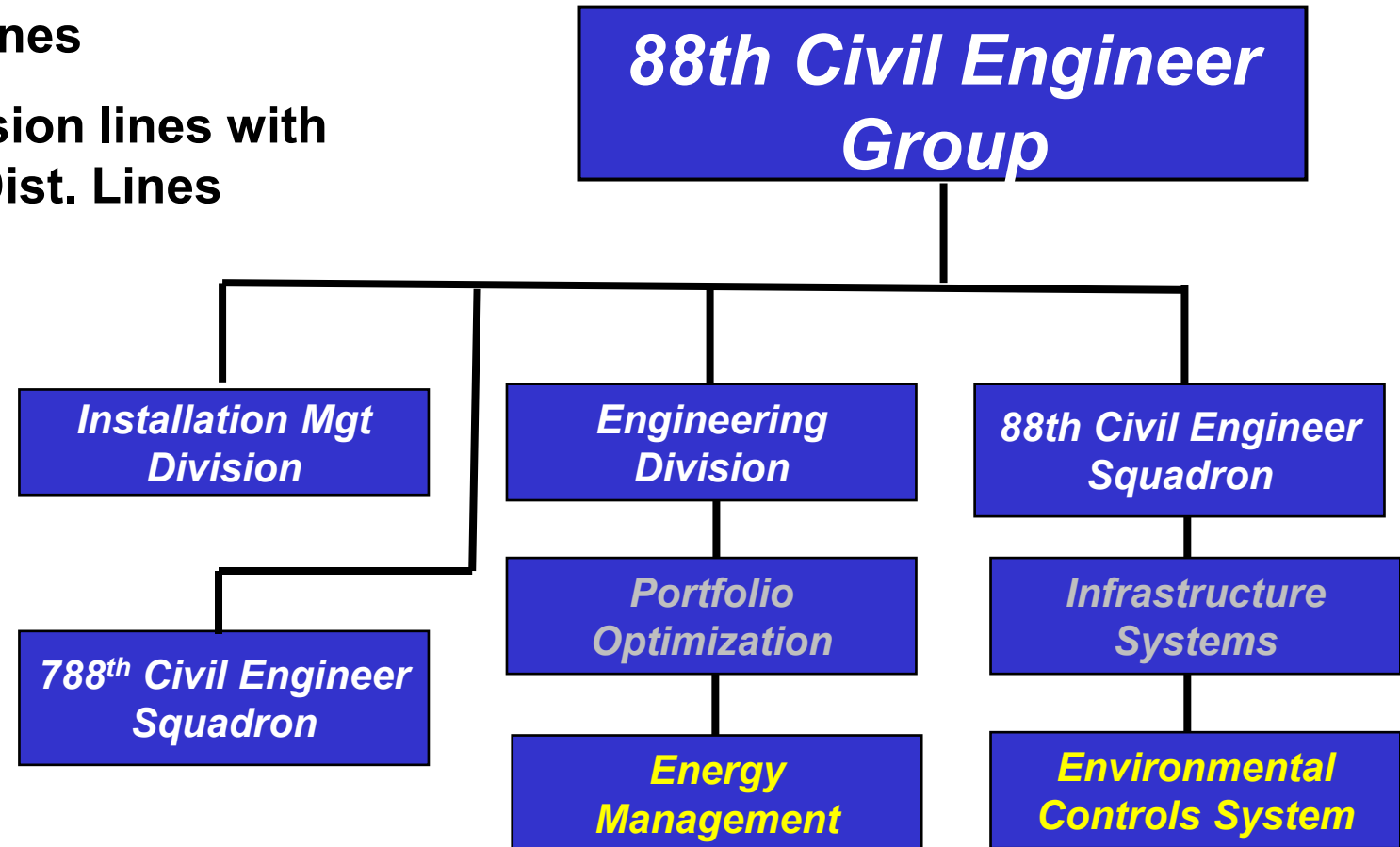
- 1. AF Installation Energy Management Program**
    - Overview
    - Utility Management
    - Awareness
    - Facility Energy Audits
    - Metering
    - Mission Energy Assurance
  - 2. Federal and Military Energy Policy and Guidance**
    - Executive Order 14057
    - AF Climate Action Plan
  - 3. Wright-Patterson AFB Actions**
    - Installation Energy Plan
    - Plans and Projects
    - Utility Procurement
    - Challenges
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# Energy Management Program

- Water Production: Two Plants with ~125 miles of Distribution System
- Natural Gas: ~ 50 miles of Dist. Lines
- Electrical System: 69KV transmission lines with 8 substations with ~375 miles of Dist. Lines
- 610 Buildings (>16M+ SF)
- 12.7 Square Miles (8,145 Acres)
- Mission Types Supported:
  - Command, Acquisitions, Analysis, Education, Research, Administrative, Airfield, Medical, Museum, Housing, BX/Commissary....



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# Utility Management

## ■ Electrical Power

- AES Ohio; Privatized distribution in FY11

Metric	Energy	Water
Cost	\$37M	\$616,300
Consumption	2,726,700 10 <sup>6</sup> BTU	964,800 kGAL

## ■ Natural Gas/Water/Wastewater; Privatized distribution in FY19

- Gas: Vectren Energy Delivery of Ohio (VEDO)
- Water and Wastewater: American Water Operations & Maintenance, Inc (AW)

## ■ Generators: CE-operated and maintained RPIE and EAID generators

## ■ Reimbursable Utility Program: Sell ~30% of our energy to 38 ion base customers

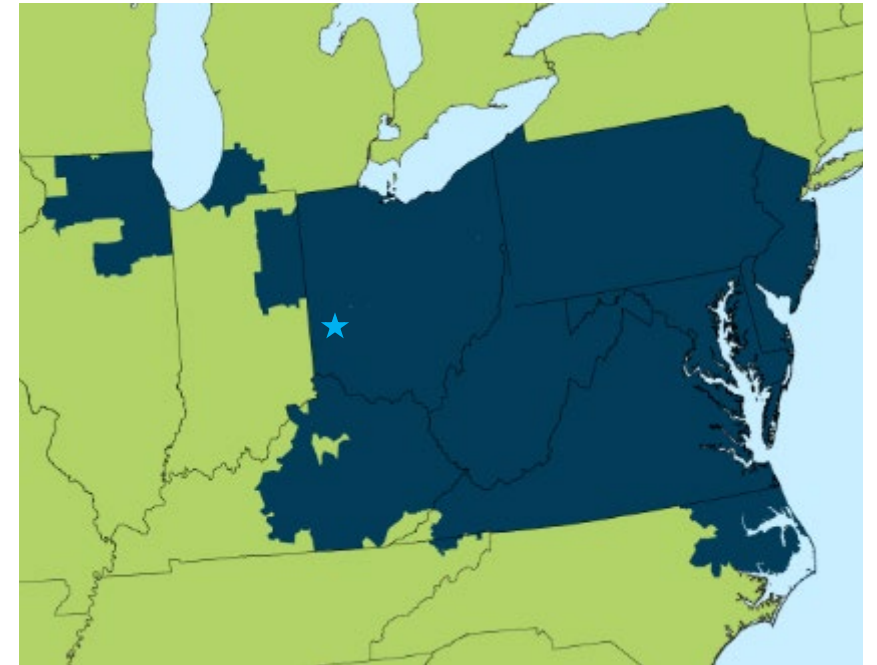
## ■ Utility System Outage Report Tracker (USORT)

- Provides real-time reporting, tracking, and analysis of short-term utility outages on Air Force Bases
- Outage data tracked includes: Date, time, duration, cause, circuit affected, and mission impact



# ***Demand Response***

- **Agreement with RTO (PJM)**
- **Demand Response lessens electrical load to aid the regional grid in managing impact during critical load or other events effecting electrical supply**
- **Two tests per year – summer and winter**
  - **Tests serve as a resilience exercise for our missions**
- **WPAFB participation helps alleviate potential energy assurance concerns that could greatly impact our mission if we experienced a full outage caused by grid stress**
- **WPAFB is compensated for participation based on achievement of test targets**
  - **Different targets for summer and winter**

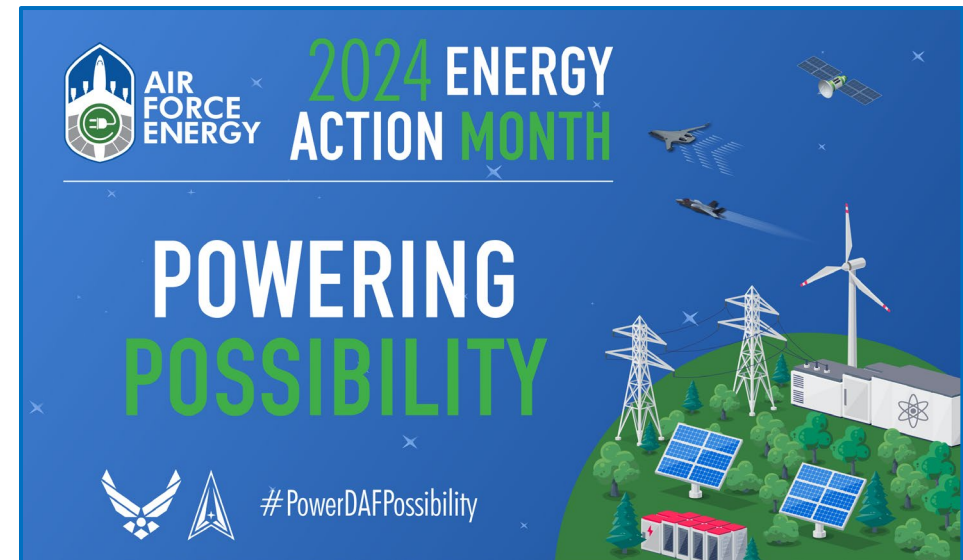


**PJM Regional Grid Territory**



# Awareness Campaign

- October is Energy Action Month (EAM)
  - **“Powering Possibility”** is the official AF theme
    - AF’s outreach campaign to highlight energy’s critical role in operations and mission continuity and to encourage smart energy use and management
    - Publishing informational program articles in the Skywrighter and WP social media posts through Public Affairs
    - [WPAFBEnergyOffice@us.af.mi](mailto:WPAFBEnergyOffice@us.af.mi)
- Mock Billing for mission partner leadership



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# *Facility Energy Audits*

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- **Conduct ASHRAE Level 1 Energy Audits**
  - **Utility/meter data analysis**
  - **As-built drawing review**
  - **Building controls review**
  - **Customer and Mx review**
  - **Site investigation**
  
- **Deep Energy Retrofit Assessment (DERA) Office of the Secretary of Defense (OSD) Task**
  - **EO 14057 requires agencies to perform deep energy retrofits on 30% of covered gross square feet (GSF) to reduce building energy intensity by 40%**
    - **AF solicited installation feedback and data analysis to identify candidates for a DERA**
  - **WP included 79 candidate facilities (7.05 Mft<sup>2</sup>)**
  - **Possible future centralized AF funding upon assessment completion**



# Metering Program

- Limited resources, technical expertise, training, and documentation needed for sustainment (Installation)
  - Not managed by EMCS
- 75% of electric meters are antiquated and no longer supported by manufacturer
  - Multi year recapitalization for meters being executed starting in FY24
- Incorporating all metering inventory in GeoBase layer for maintenance/repair simplification and database management

Utility	Required	Installed	Complete
Electricity	225	154	68%
Natural Gas	93	28	30%
Steam/Heat	155	0	0%
Water	60	3	5%





# *Mission Energy Assurance*

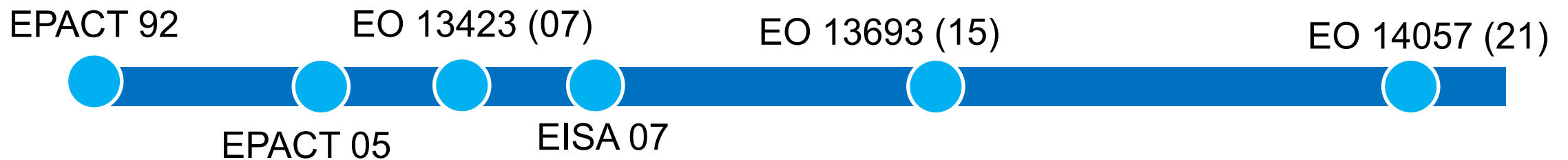
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- **Complete Installation Energy Plan (IEP):**
  - Identified energy & water resilience gaps
  - Inaugural IEP completed FY21
  - Minor annual updates
  - Major refresh in FY26
- **Energy Resilience Readiness Exercise (ERRE) or “Black Start”:**
  - Two major complete in FY21 and FY23
- **Bi-Annual Nationwide Grid-Ex:**
  - Observed in FY21 and FY23



# Policy and Guidance

- **AF Climate Action Plan**
  - **Priority 1: Maintain Air and Space Dominance in the Face of Climate Risks**
  - **Priority 1: Make Climate Informed Decisions**
  - **Priority 1: Optimize Energy Use and Pursue Alternative Energy Sources**
- **AFMC Energy Assurance Campaign Plan**
  - **Optimized Systems and Processes**
  - **Cyber-resilient Control Systems**
  - **Mission Matched Capabilities**
  - **Reliable and Managed Infrastructure**
  - **System Performance Assurance**



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# ***Executive Order 14057***

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- **Operations must be resilient, sustainable, and preserve strategic choice while building enduring advantages**
- **DoD will prioritize long-term value while seeking to fully incorporate resilience, emission reductions, and environmental preservation**
- **Sustainability Goals**
  - **100% Carbon Pollution-Free Electricity (CFE) by FY30**
  - **Net-Zero Emissions Buildings, Campuses, and Installations by FY46**
  - **100% Zero-Emission Vehicle (ZEV) Fleet Acquisitions by FY35**
- **Related:**
  - **Deep Energy Retrofit Assessments (DERA) OSD Tasking**
  - **Flightline Electrification**



# Climate Action Plan



## Energy Efficient Buildings

They are already efficient, right?



## Carbon Free Electricity (CFE)

Buying CFE wherever we can get it, no matter the cost



## Electric Vehicle Supply Equipment (EVSE)

Install everywhere ASAP

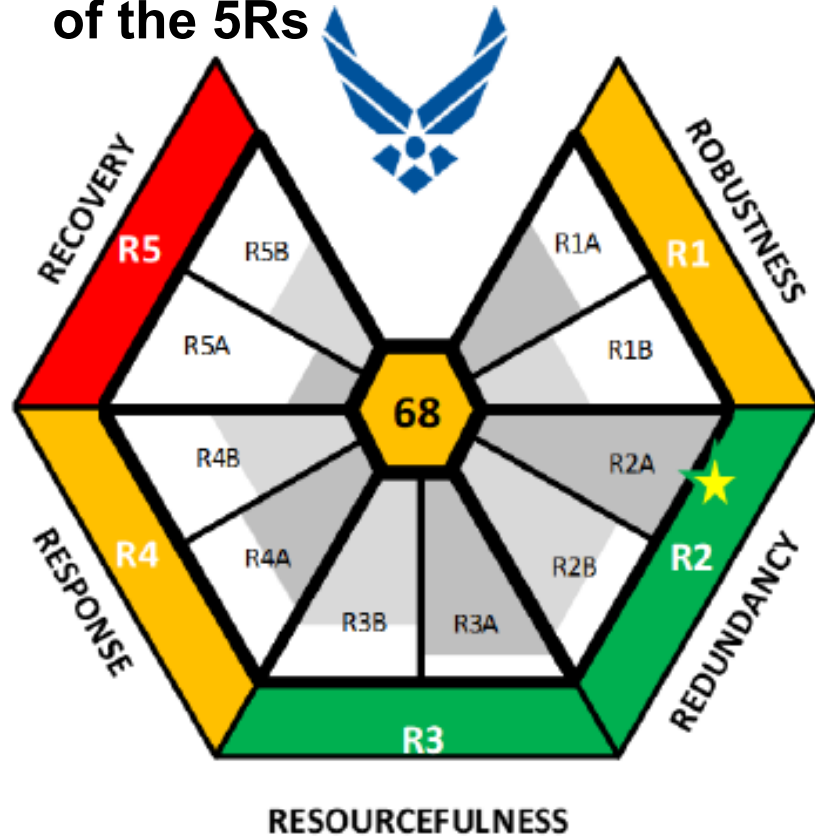


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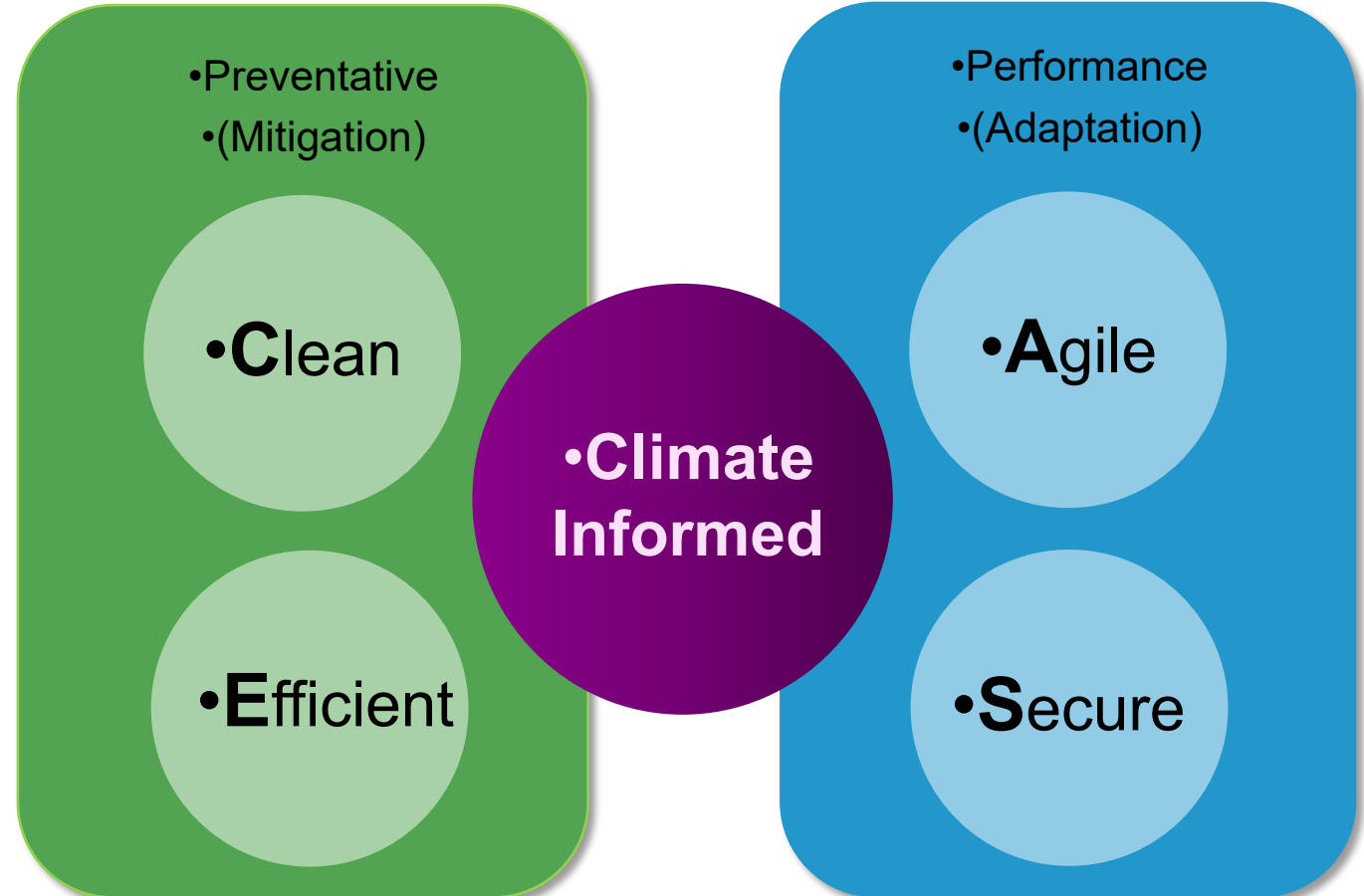


# Installation Energy Plan

- Resilient Energy Assurance Framework (REAF) comprised of the 5Rs



**EXAMPLE ONLY**



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# Heat Decentralization

## ■ Two Major Projects

- Line C: \$24M, FY17, 4 Major Complexes, 271,800 MBtu Annual Savings
- Partial Line D: \$8.2M, FY20, 20+ Buildings, 84,300 MBtu Annual Savings
- Replaced existing steam/high temp hot water (HTHW) heating system w/ local natural gas boilers



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# ***Campus District Cooling Plant***

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- **Major Facility Campus District Cooling Plant**
  - **Energy Resilience MILCON**
  - **17.1 KSF central cooling plant**
  - **Modern and efficient cooling redundancy**
  - **Increases system resiliency**
  - **680 MBtu annual savings**
  - **Currently in design phase**



# *Utility Upgrades*

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## ■ Electricity

- AES Ohio is both WPAFB's
  - Utility service provider to the installation fence line and
  - The on base privatized system owner
- Making several resiliency and system upgrades

## ■ Natural Gas

- CenterPoint similar ownership as AES w/ electric
- Expanding system for needed facility infrastructure support and heat decentralization

## ■ Water/Wastewater

- American Water on base system owner only
  - Significant infiltration repairs, pressure improvements, and backup generation

## ■ Wright-Patterson Regional Counsel of Governments Collaboration (WPRCOG)





# *Solar Concepts*

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- **Historically, renewable energy projects required positive life cycle economic benefits**
- **Now, WPAFB capitalizing on the AF's newer CASE framework**
- **Multiple concepts in development**
  - **Impacts mission in both Area A and Area B**
  - **Tied with microgrid capabilities to maximize energy assurance**
  - **Challenges include large funding requirements, privatized utilities, cyber security concerns**



# ***Non-Tactical Vehicle (NTV) Fleet Electrification***

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- **Executive Order 14057 and the AF Climate Action Plan**
- **Government vehicles only currently; no personal vehicle charging**
- **Electric Vehicle Charging Facility Siting and Acquisition Plan (ESAP)**
  - **Shows the aggregated and prioritized vehicles into potential charging sites**
  - **Optimizes infrastructure and port-to-vehicle ratio**
  - **Define Installation-specific acquisition tools**
  - **Considers distribution capacity; AES planning integration**
  - **Study Complete**
- **Infrastructure project underway**
- **Next Step – GSA coordination for Charger Acquisition process**



# *Utility Procurement*

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- **Typical AF Energy Manager duties, but now EO 14057 adds requirements:**
- **Carbon Pollution-Free Electricity (CFE) Options:**
  - **Produced Onsite:**
    - **Currently ~500 gigawatt hours (GWh) of onsite CFE projects in development across all DoD installations**
    - **WPAFB in early stages with multiple, long-term resilience CFE efforts**
  - **Commodity Procurement:**
    - **DLA Energy will serve as the procurement agent for the aggregated DoD requirement**
- **DLA seeking a 20-year CFE aggregated commodity contract for federal site**



# Challenges

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## ■ WPAFB Present

- Favorable regional energy rates
- Plentiful and economical Base generated water supply
- Renewable/Alternative Energy Sources
- Aging Facilities and Infrastructure
- Historical Facilities
- Available Facilities and Land

## ■ WPAFB Future

- Continue identifying energy resiliency requirements w/ evolving mission sets
- Update Installation Energy Plan Formulation in alignment with the Installation Development Plan
- Implement Resiliency requirements into ALL execution plans