Kansas Security Committee Installation Energy and Water Plan (IEWP)

Presented by:

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Director, Public Works

Outline

- Installation Energy and Water Plan (IEWP) Overview
- Kansas Army National Guard (KSARNG) Resilience and Conservation Infrastructure
- Energy Master Plans
- Energy Conservation Investment Program (ECIP)
- Energy Resilience and Conservation Investment Program (ERCIP)
- Kansas Army National Guard Energy Security Performance

IEWP Program Overview

- Introduction
- Mission Critical Facilities
- Mission Critical Overview
- Risk Assessment
  - Critical Mission Sustainment
  - Critical Mission Risk
  - Installation Risk
- Implementation Plan
- Tracking Progress

IEWP Introduction

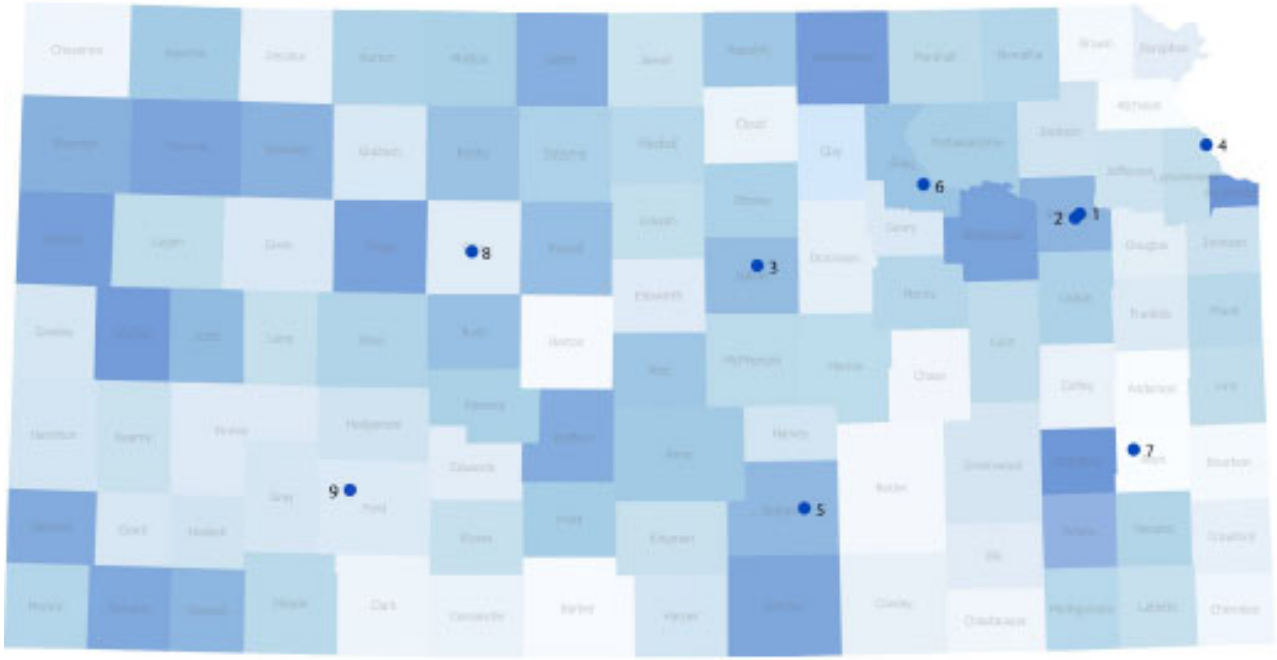
The IEWP:

- A Roadmap all Army installations are using to achieve the following:
  - Protect Energy and Water Security
  - Defend Energy and Water Resilience
  - Ensure Mission Readiness
  - Safeguard Mission Assurance
- New Consolidated Planning Tool that reduces the number of energy and water security and management planning requirements.
- Integrates higher-level strategic guidance, plans, and policies with installation- and facility-level data that enables the installation to enhance mission readiness through energy and water management and resilience.
- Update every five years with annual revisions.
- Final Engineer and Energy Manager requirements complete.
- Annual refinements and post cyber-security protocol in progress.

Mission Critical Facility Criteria

- Critical facilities are buildings and utility infra-structure that because of their function, size, service area, or uniqueness, have the potential to cause disruption to mission critical functions or harm to humans.
  - Kansas specific – at least one in each KS Homeland Security region
  - Division/Brigade/Garrison Headquarters
  - Data centers that support mission activities
  - Network communications nodes
  - E&W utility infrastructure
  - Facilities supporting training missions
  - Logistics
  - Supply
  - Maintenance (of Communications infrastructure and E&W utility infrastructure)
  - Designated emergency shelters (e.g., Child Development Centers, gymnasiums, etc.)

Mission Critical Facilities



Location #	Site Location	Included Buildings
1	Topeka JFHQ Complex, Topeka	Topeka State Defense Building 100 / Topeka Readiness Center 102
2	North and South Forbes Campuses, Topeka	Forbes Civil Support Team CST 2003 / Forbes JFHQ 2005 / Forbes AASF 636 / Forbes AASF 682 / Forbes AASF 688
3	Salina Training Complex, Salina	Salina AASF 2 2917H / Salina KSRTC Nickell Hall 320 / Salina KSRTC Conference Center 365
4	Leavenworth MTC, Leavenworth	Leavenworth MTC Tice Hall 1951
5	Wichita	Wichita North Readiness Center 100
6	Manhattan	Manhattan Readiness Center 100
7	Iola	Iola Readiness Center 100
8	Hays	Hays Readiness Center 100
9	Dodge City	Dodge City Readiness Center 100

IEWP Mission Critical Overview

- **Critical mission sustainment (CMS)** – Establish whether facilities with little or no tolerance for energy and/or water disruption have the E&W needed to sustain operations under all operating conditions. KSARNG established the CMS minimum duration to be 14 days. This CMS minimum duration for KSARNG is based on the requirement of Army Directive 2017-07 or subsequent requirements.
- **Critical mission risk reduction (CMRR)** – Identify deficiencies related to infrastructure condition, lack of redundancy, and infrastructure exposure specifically in, or directly connected to, critical facilities.
- **Installation risk reduction (IRR)** – Establish general risk to the installation from inadequate operational procedures and plans, overall E&W infrastructure condition, and availability/access to E&W resources to support installation-wide needs. The installation risk assessment identified inefficient use of E&W resources in all installation facilities as deficiencies.

IEWP Risk Assessment

- Critical Mission Sustainment
  - Electricity
  - Natural Gas
  - Propane
  - Water and Wastewater
- Critical Mission Risk
  - Electricity
  - Natural Gas
  - Water and Wastewater
- Installation Risk
  - Energy
  - Water

CMRR - Electricity System's

Table 2. Electricity System Deficiencies and Estimated Count of Facilities and Critical Missions Affected

		Missions Affected															
Deficiency	**Count of Critical Facilities**	**Topeka State Defense Bldg. 100**	**Topeka Readiness 102**	**Forbes Civil Support Team CST 2003**	**Forbes JFHQ 2005**	**Forbes AFRC 638**	**Forbes AASF 636**	**Forbes AASF 682**	**Leavenworth MTC Tice Hall 1951**	**Salina KSRTC Conference Center 365**	**Salina KSRTC Nickell Hall 320**	**Salina AASF 2 2917H**	**Dodge City Readiness Center 100**	**Hays Readiness Center 100**	**Manhattan Readiness Center 100**	**Iola Readiness Center 100**	**Wichita North Readiness Center 100**
Dead End Primary Feeder	3	X	X						X								
Single Primary Transformer Feed	16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Single Service Transformer	16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Single Secondary Service from Transformer	16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
No Backup Generator	6			X						X	X**		X	X		X	
Inadequate On-site Fuel Storage	16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
No Alternative Electrical Source	16	X	X	X	X	X	X	X	X	X	X**	X	X	X	X	X	X

X** – Project competed successfully for ERCIP program funding; includes an emergency backup generator and photovoltaic solar panel arrays. Currently in the construction phase with the intent to be completed by 2023.

CMRR - Natural Gas System's

Table 3. Natural Gas System Deficiencies and Estimated Count of Facilities and Critical Missions Affected

		Missions Affected														
Deficiency	**Count of Critical Facilities**	**Topeka State Defense Bldg. 100**	**Topeka Readiness 102**	**Forbes Civil Support Team CST 2003**	**Forbes JFHQ 2005**	**Forbes AFRC 688**	**Forbes AASF 636**	**Forbes AASF 682**	**Leavenworth MTC Tice Hall 1951**	**Salina KSRTC Conference Center 365**	**Salina KSRTC Nickell Hall 320**	**Salina AASF 2 2917H**	**Dodge City Readiness Center 100**	**Hays Readiness Center 100**	**Manhattan Readiness Center 100**	**Iola Readiness Center 100**	**Wichita North Readiness Center 100**
Inadequate On-Site Generator Fuel Storage	3						X	X				X				
Inadequate On-Site Building Heating Fuel Storage	16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dead End Distribution Mains	1								X								
Alternative Propane Fuel Supply	16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

CMRR - Water and Wastewater System's

Table 4. Water and Wastewater System Deficiencies and Estimated Count of Facilities and Critical Missions Affected

		Missions Affected														
Deficiency	**Count of Critical Facilities**	**Topeka State Defense Bldg. 100**	**Topeka Readiness 102**	**Forbes Civil Support Team CST 2003**	**Forbes JFHQ 2005**	**Forbes AFRC 688**	**Forbes AASF 636**	**Forbes AASF 682**	**Leavenworth MTC Tice Hall 1951**	**Salina KSRTC Conference Center 365**	**Salina KSRTC Nickell Hall 320**	**Salina AASF 2 29171**	**Dodge City Readiness Center 100**	**Hays Readiness Center 100**	**Manhattan Readiness Center 100**	**Iola Readiness Center 100**	**Wichita North Readiness Center 100**
Inadequate On-Site Water Storage	16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inadequate On-Site Emergency Wastewater Facilities or Storage	16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
No On-site Water Storage Plan	16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
No Onsite Wastewater Plan	16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

IRR - Electricity System's

ISR-MC Supplement Table for Electric Systems

	Critical Mission Sustainment						Assured Access						Infrastructure Condition						System Operation				
Deficiency	ECMS-001 Emergency Response	ECMS-002 Critical Mission	ECMS-003 Threat Assessment	ECMS-004 Adequate Onsite Energy for 14-day Emergency Operations	ECMS-005 Backup Energy Onsite	Overall Attribute Rating	EAA-001 Relationship with Utility	EAA-002 Power Reliability	EAA-003 Power Quality	EAA-004 Redundancy of Power Supply	EAA-005 Diversity of Power Supply	Overall Attribute Rating	EIC-001 Power System Reliability	EIC-002 Impact of Unplanned Onsite Outages	EIC-003 Power System has Redundancy	EIC-004 On-Site Storage Capacity	EIC-005 Testing/Inspection/PM	Overall Attribute Rating	ESO-001 Complete/Adequate Plans	ESO-002 Planning Coordination (internal+ external)	ESO-003 Adequate Personnel (in place/trained/etc)	ESO-004 Periodic Exercises of Plans	Overall Attribute Rating
Topeka State Defense Bldg. 100																							
Topeka Readiness Center 102																							
Forbes Civil Support Team CST 2003																							
Forbes JFHQ 2005																							
Forbes AFRC 688																							
Forbes AASF 636																							
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Manhattan Readiness Center 100																							
Wichita North Readiness Center 100																							

IRR - Natural Gas System's

ISR-MC Supplement Table for Gas Systems

	Critical Mission Sustainment						Assured Access						Infrastructure Condition						System Operation					
Deficiency	GMS-001 Emergency Response	GMS-002 Critical Mission Identification	GMS-003 Threat Assessment	GMS-004 Adequate Onsite Energy for 14-day Emergency Operations	GMS-005 Backup Energy Onsite	Overall Attribute Rating	GAA-001 Relationship with Utility	GAA-002 Gas Reliability	GAA-003 Gas Quality	GAA-004 Redundancy of Gas Supply	GAA-005 Diversity of Gas Supply	Overall Attribute Rating	GIC-001 Gas System Reliability	GIC-002 Impact of Unplanned Onsite Outages	GIC-003 Gas System has Redundancy	GIC-004 On-Site Storage Capacity	GIC-005 Testing/Inspection/PM	Overall Attribute Rating	GSO-001 Complete/Adequate Plans	GSO-002 Planning Coordination (internal + external)	GSO-003 Adequate Personnel (in place/trained/etc)	GSO-004 Periodic Exercises of Plans	Overall Attribute Rating
Topeka State Defense Bldg. 100																								
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Forbes AFRC 688																								
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Dodge City Readiness Center 100																								
Hays Readiness Center 100																								
Iola Readiness Center 100																								
Manhattan Readiness Center 100																								
Wichita North Readiness Center 100																								

IRR - Water and Wastewater System's

ISR-MC Supplement Table for Water Systems

	Critical Mission Sustainment						Assured Access						Infrastructure Condition						System Operation					
Deficiency	WCM-001 Emergency Response	WCM-002 Critical Mission Identification	WCM-003 Threat Assessment	WCM-004 Adequate Onsite Energy for 14 day Emergency Operations	WCM-005 Backup Energy Onsite	Overall Attribute Rating	WAA-001 Relationship with Utility	WAA-002 Water Reliability	WAA-003 Water Quality	WAA-004 Redundancy of Water Supply	WAA-005 Diversity of Water Supply	Overall Attribute Rating	WIC-001 Water System Reliability	WIC-002 Impact of Unplanned Onsite Outages	WIC-003 Water System has Redundancy	WIC-004 On-Site Storage Capacity	WIC-005 Testing/Inspection/PM	Overall Attribute Rating	WSO-001 Complete/Adequate Plans	WSO-002 Planning Coordination (internal + external)	WSO-003 Adequate Personnel (in place/trained/etc)	WSO-004 Periodic Exercises of Plans	Overall Attribute Rating
Topeka State Defense Bldg. 100																								
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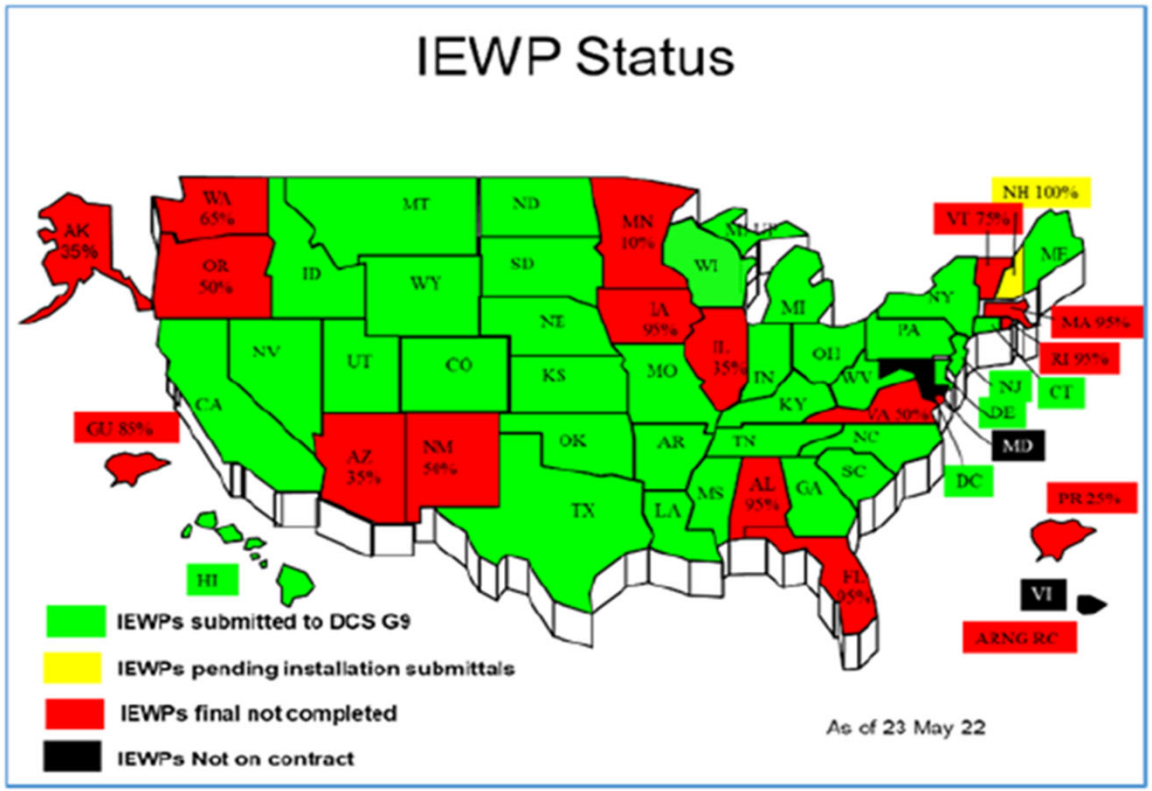
Manhattan Readiness Center 100																								
Wichita North Readiness Center 100																								

IEWP Implementation Plan

- **Enhance operations and plans (OP)** – Actions that reduce overall installation risk from E&W service disruptions through preparedness and improved data quality
- **Reduce demand (RD)** – Actions that reduce overall installation risk from E&W disruptions and increase the efficiency with which E&W resources are used
- **Improve infrastructure (INF)** – Actions that reduce risk of disruption at critical facilities through improvements to reliability, redundancy, and exposure
- **Increase capacity (CAP)** – Actions that enable longer-term sustainment of critical facilities and that reduce risk of disruption at all critical facilities through onsite generation and/or increased supply of E&W utilities

IEWP Tracking Progress

- **Kansas IEWP Status: GREEN.**
- **Only Green States Will Receive ANY Annual Energy Program or Project Funding!**



ARNG	Assigned	Submitted	Review	Revised	Accepted	% Complete
FY20*	4	4	0	0	4	100%
FY21**	99	70	12	0	58	59%
ARNG Total:	**103**	**74**	**12**	**0**	**62**	**60%**

Resilience and Conservation Infrastructure

Mission Critical Locations

Location	Facility Title	Generator	DDC Controls	Solar Power	Geothermal	Solar Walls (Heating)	Advanced Metered Complete
Topeka	State Defense Bldg.						
Topeka	Nickell Readiness Center						
Forbes Field	Joint Forces HQ Bldg 2005						
Forbes Field	Civil Support Team Bldg. 2003						
Forbes Field	Aviation Support AASF#1						
Forbes Field	Aviation Support Hangar 682						
Salina	Aviation Support AASF#2						
Forbes Field	Armed Forces Reserve Center						
Manhattan	Manhattan Readiness Center						
Wichita	Wichita North Readiness Center						
Salina	Nickell Hall Billeting						
Salina	Conference Center						
Hays	Hays Readiness Center						
Dodge City	Dodge City Readiness Center						
Iola	Iola Readiness Center						
Ft Leavenworth	35th Division HQ Bldg.						

Other Targeted Locations

Location	Facility Title	Generator	DDC Controls	Solar Power	Geothermal	Solar Walls (Heating)	Advanced Metered Complete
Ft Riley	Vehicle Maintenance Support (MATES)						
Salina	Regional Trianing Institue Bldg 217						
Salina Range	Barracks Buildings						
Forbes Field	Hangar 681						
Forbes Field	Hangar 680						
Hutchinson	Hutchinson Readiness Center						
Hutchinson	Field Maintenance Shop						
Pittsburg	Pittsburg Readiness Center						
Lenexa	Lenexa Readiness Center						
Topeka	USPFO						
Wichita	Field Maintenance Shop						
Salina	Unit Training Equipment Shop						
Salina	Eckert Hall (Medical Facility)						
Ft. Leavenworth	Transient Training Barracks						
Ft. Leavenworth	Mission Training Center Bldg. 1951						
Ft. Leavenworth	Mission Training Center Bldg. 1952						
Dodge City	Field Maintenance Shop						

Energy Master Plan

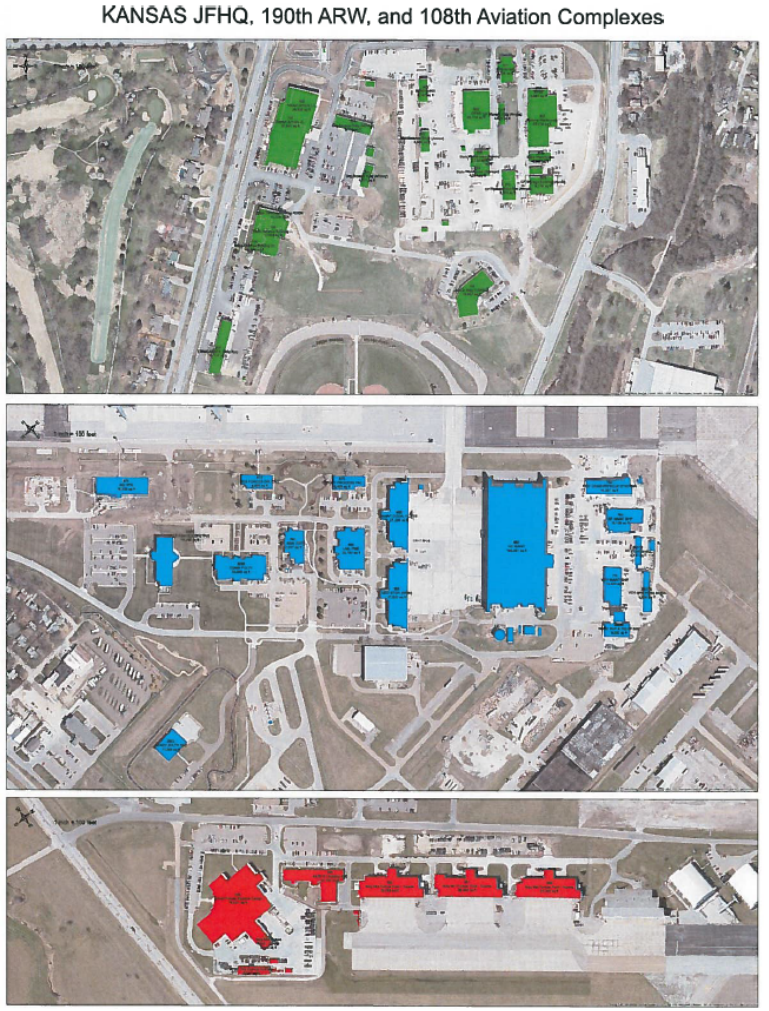
- The purpose of this Comprehensive Energy and Water Master Plan is to evaluate existing Kansas Army Nation Guard (KSARNG) facilities with respect to energy and water utilization and develop a 5-year plan as a foundation to meet Federal Conservation, Sustainability and Energy Savings goals.
  - Building Envelope
  - Lighting and Controls
  - Power Distribution
  - Energy Management
  - Plug Load Management
  - Domestic Hot Water
  - Water Conservation
  - Alternative and Renewable Energy
  - Energy Storage

Energy Master Plan

- Primary sustainability planning goals:
  - Reduce Energy Use Intensity (EUI) 2.5% annually with a total reduction of 25% by FY2025. Baseline FY2015.
  - Reduce water use intensity 2% annually with a total reduction of 36% by FY2025. Baseline FY2007.
  - Produce and consume 13% electric and thermal renewable energy by FY2018, 25% by FY2025.
  - Produce and consume 15% electric renewable energy by 2018, 30% by FY2025.

Energy Master Plan - Forbes

- The Kansas Air National Guard and Kansas Army National Guard retained HTK Architects to develop an update to the 2009 Energy Master Plan. There were two main goals of this Energy Master Plan Update: 1) Estimate energy and resource consumption at the Army and Air National Guard facilities and 2) Propose new energy production, energy conservation and procurement projects.



Energy Master Plan - Forbes

- **Critical Load**
  - Functions within the facility are assigned a level of criticality. Those functions are then assessed resource loads (MMBTU, kWh, etc.) that are required to be met to fulfill their operational obligation.
  - Resource loads are analyzed to determine the critical level of those functions, assigning a minimum resource use.
  - The potential project is evaluated against its ability to directly remediate a risk to these critical loads.
- **Implementation and Execution**
  - A life cycle analysis must be completed prior to authorization. The project must prove to be robust over the long term.
  - The project must be financially sensible to warrant investment. Estimates must be refined to map to simplified payback justifications.
  - The project must be able to be maintained and be operational throughout its planned life.
- **Long Term Performance**
  - Project metrics must be defined that analyze and ensure performance continues to benefit the DoD installation.
  - These metrics may be specific to the project, installation, and/or technology.

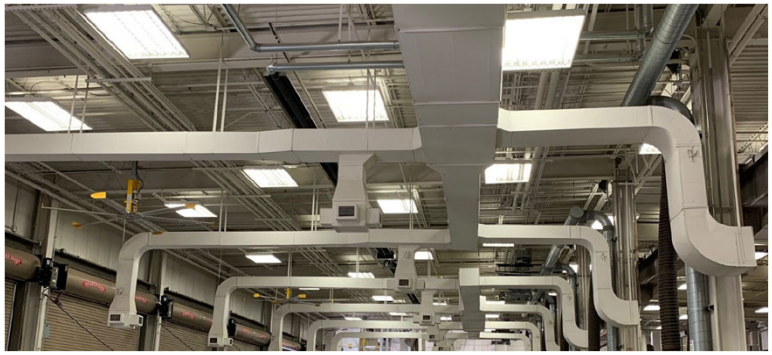
Energy Master Plan - Forbes

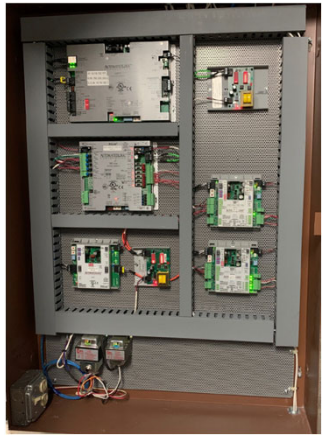
SUMMATION OF STUDIED ALTERNATIVES ENERGY PLAN FORBES FIELD	Energy Production	Solar/PV	Absorption Chiller	Vegetative / Woody Biomass	Battery Energy Storage Systems (BESS)	Combined Heat and Power / Cooling	CNG Deliveries	Wind	Fuel Cells	Minimal Development of Natural Gas Reserves	Anaerobic Digestion	Gasification	Flash Pyrolysis	Hydro	Energy Conservation (EO 13693 Section 3.a)	Demand Response Management	Water and Wastewater Re-use	Spinning Reserve and Demand Reduction	Building Envelope and System Modifications	Energy Procurement	Electricity Procurement Strategies	Natural Gas Synthetic Hedges
Preliminary Evaluation		Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N		Y	Y	Y	Y		Y	N
Recommended for Implementation		Y	Y	N	N	Y	N	N	N	N	N	N	N	N		Y	N	N	Y		N	N
Energy Independence																						
Power		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Heat		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Transportation Fuel		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Energy Security																						
Power		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Heat		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Transportation Fuel		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Net Zero Compliance																						
Energy		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Water		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Waste		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Cost Effectiveness																						
Captital Cost Intensive		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Operations Cost Reduction		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Long Term Stability		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Sustainability																						
Minimum 25% Renewable Energy		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Minimum 25% Renewable Fuels		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Capacity for Growth		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Reduced Carbon Footprint		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Reduced Water Footprint		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Regulatory Impact																						
NEPA Compliance		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Land Planning		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Mineral Rights Restoration		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Public Outreach																						
Center for Excellence Establishment		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Watershed Preservation		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Increased Grid Security Eastern KS		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Timeframe																						
Less than 3 years		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Less than 5 years		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Less than 10 years		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●

● - strong potential ● - moderate potential; ● - slim potential

ECIP – Fort Riley

- **Scope: The 149,793 SF MATES facility (Building 1460) will be fitted with a new closed-loop geothermal heat pump system to replace the existing heating, cooling, and domestic hot water systems in this facility. Lighting improvements include installation of dual function occupancy sensors. $947,000 Project**
- **Status: Project Completed. Programmed FY11**

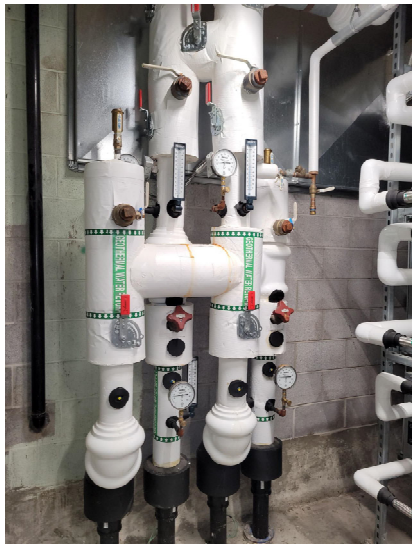




ECIP - Topeka

- **Scope: Install two ground source HVAC systems, two water source HVAC systems, one high efficiency HVAC system, perform interior and exterior lighting upgrades at multiple buildings, and provide demand control ventilation in one building at the KSARNG Topeka Forbes Complex. $1.85M Project**
- **Status: Project completed. Programmed FY15**

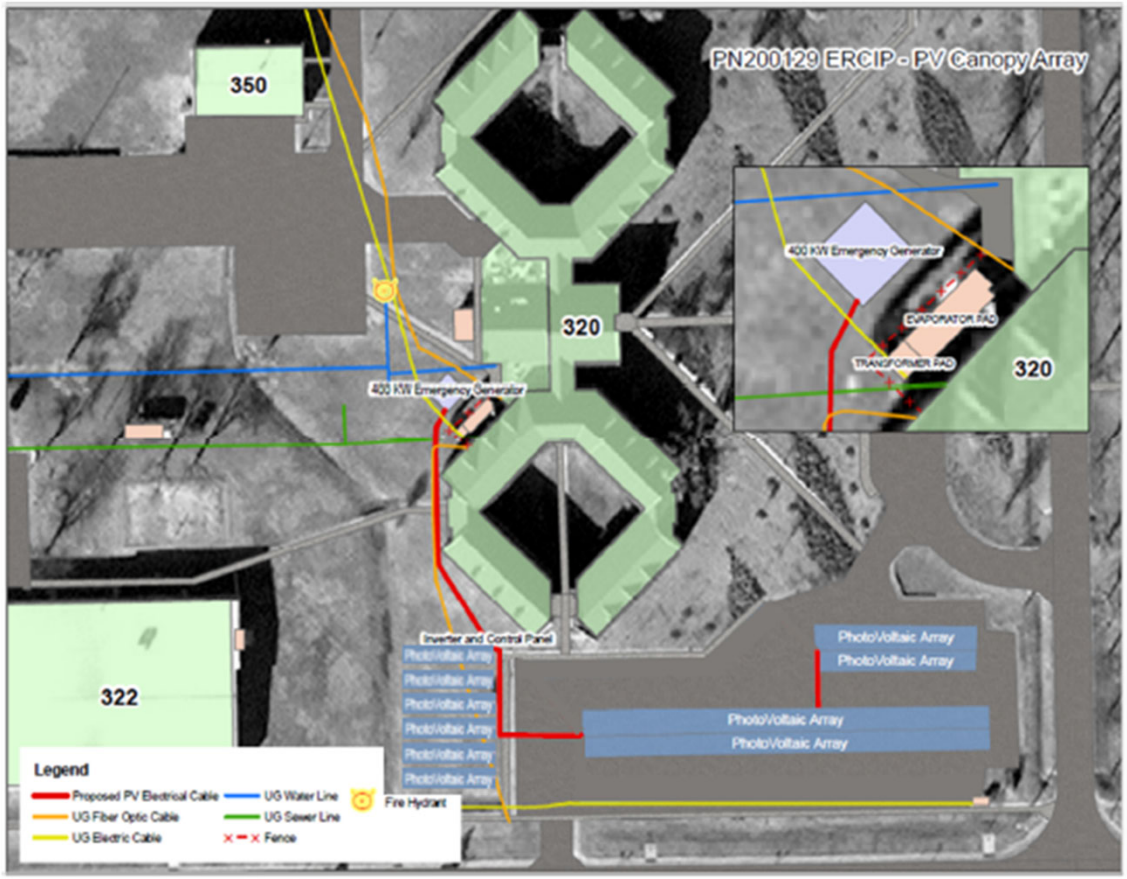


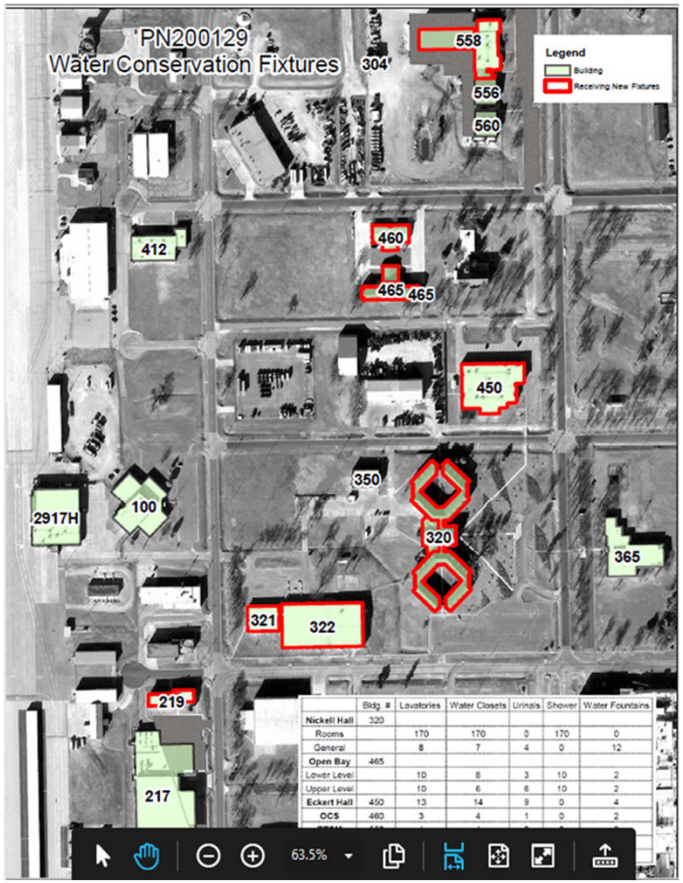






ERCIP - Salina

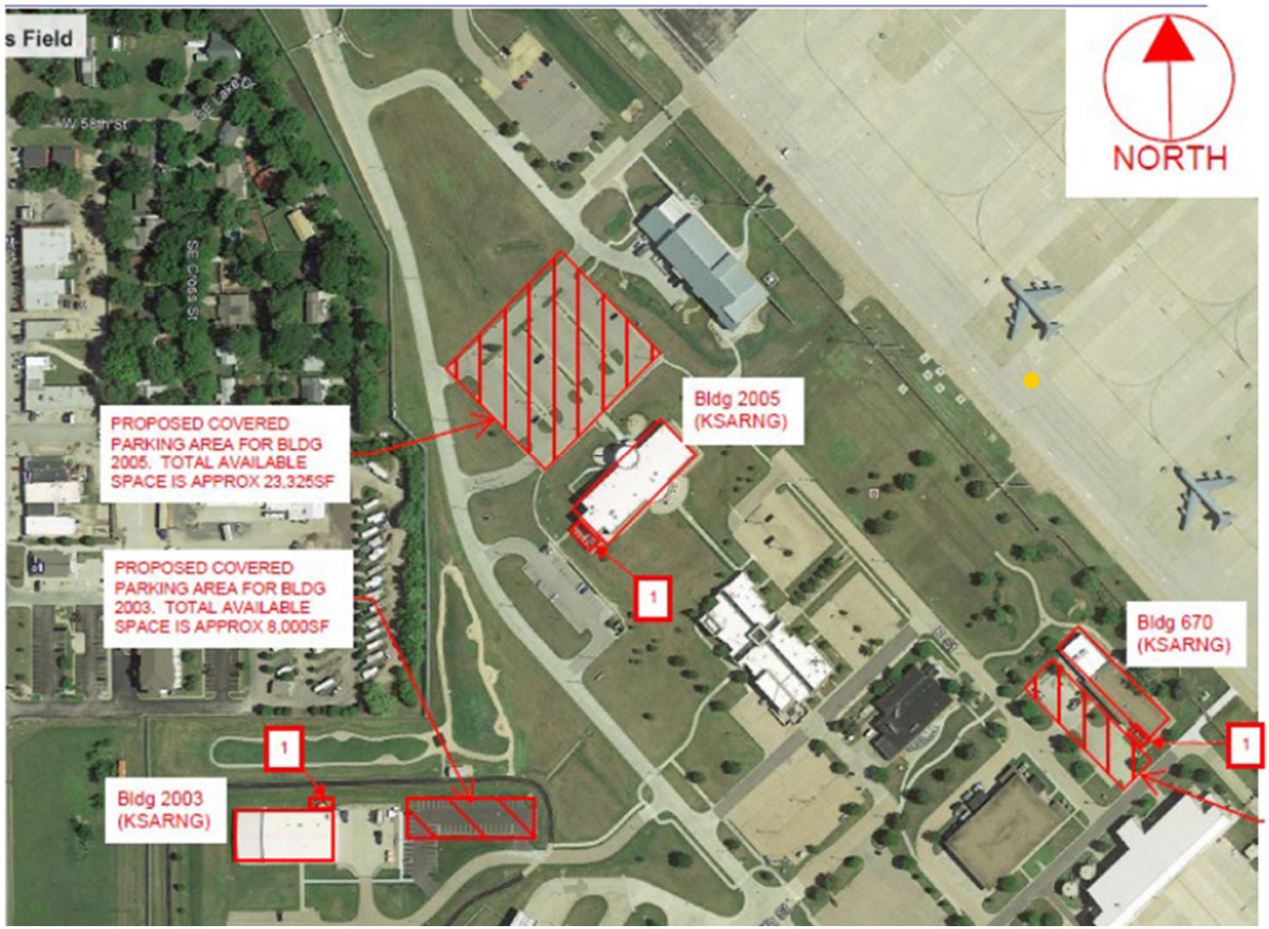
- **Scope: A majority of the project will be completed on Nickell Barracks. All bathroom fixtures on the Salina Complex that are not efficient will be replaced. A 400 kW Ground and Canopy-Mounted Carport Photovoltaic Array will be installed in the Nickell Barracks parking lot. A 400 kW Generator will be installed at Nickell Barracks. $3.7M Project**
- **Status: Currently being constructed and 49% complete. Programmed FY20**





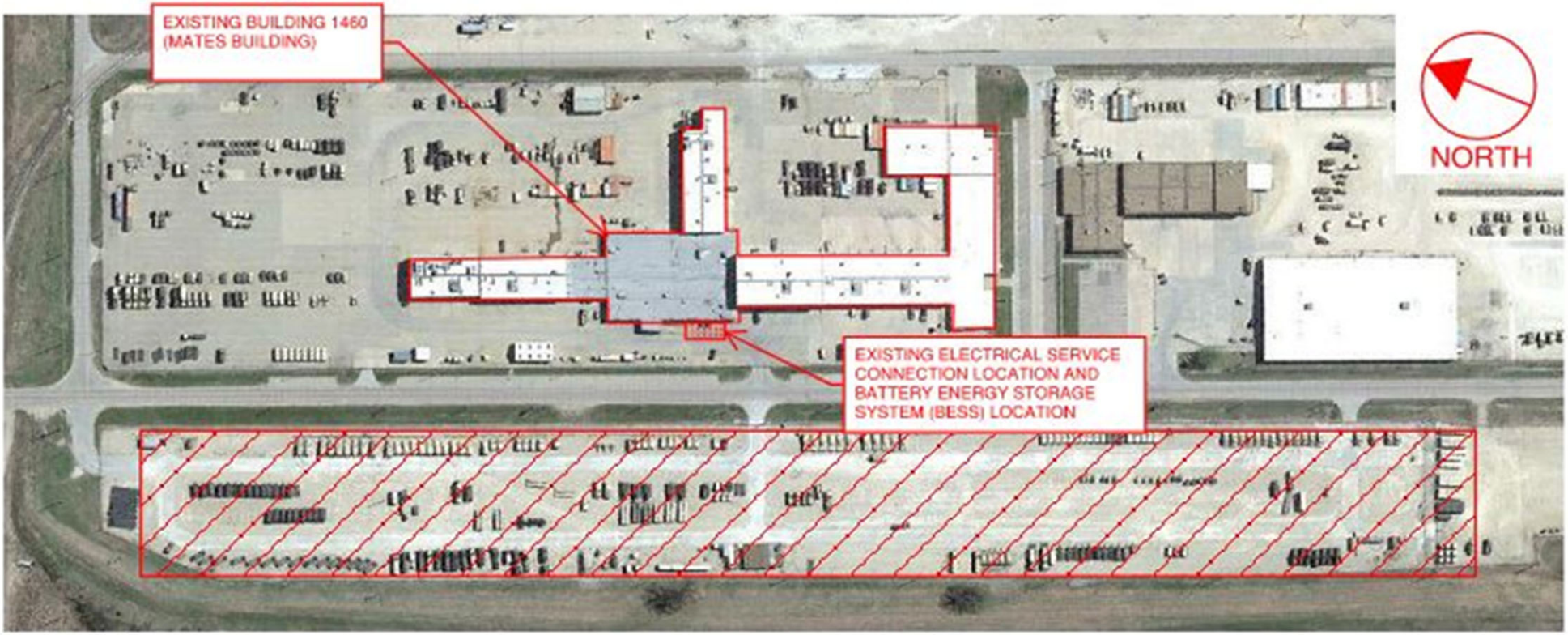
ERCIP - Forbes

- **Scope: Project will develop electrical energy production, battery storage capacity, and distribution systems. $4.8M Project**
- **Status: Project critiqued per Office of the Secretary of Defense level refinements and new templates. Moved to the next level of competition. Competing for FY24**



ERCIP – Fort Riley

- **Scope: Project will develop electrical energy production, battery storage capacity, and distribution systems. $6.4M Project**
- **Status: Project critiqued per Office of the Secretary of Defense level refinements and new templates. Moved to the next level of competition. Competing for FY26**



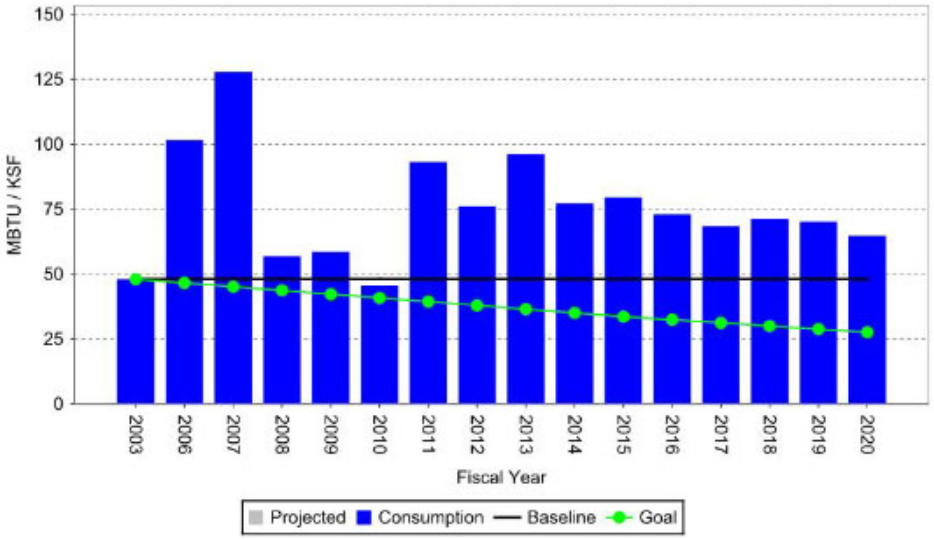
ERCIP – Fort Leavenworth

- **Scope: Future conversion of Electric Utility to Private Microgrid complete with Central Generator(s), Solar Photovoltaic, Battery Storage and Water Reduction.**

- **Status: Project currently in development with engineer for Programmatic Design.**

Energy Security Performance

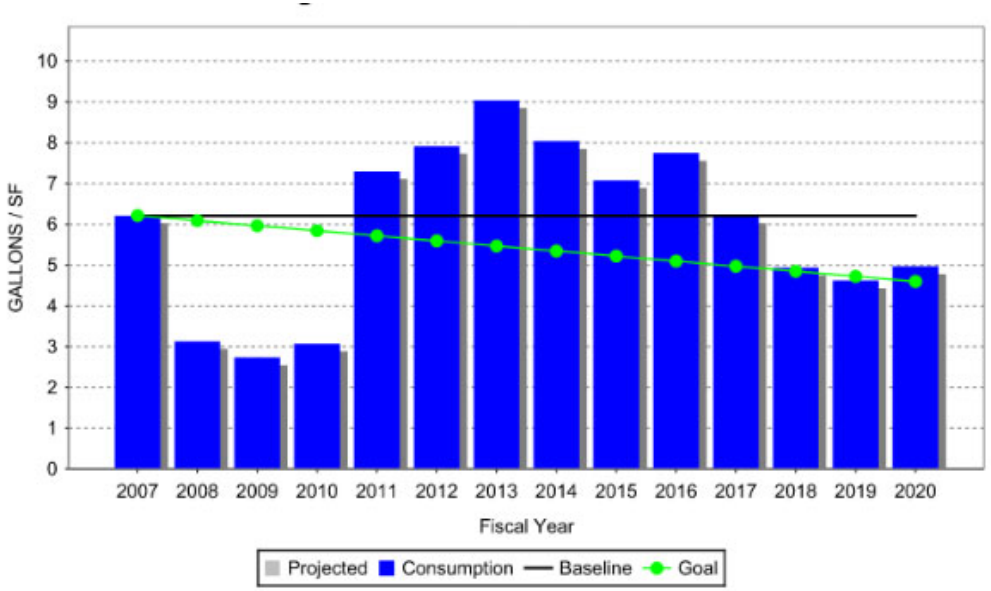
Energy Reduction Performance



If a projected bar is shown for the current fiscal year, the blue area is based on actual consumption and KSF data entered, while the gray area projects the year end consumption per unit area if consumption continues at the same rate.

Figure 1. KSARNG Energy Use Intensity Performance

Water Reduction Performance



If a projected bar is shown for the current fiscal year, the blue area is based on actual consumption and KSF data entered, while the gray area projects the year end consumption per unit area if consumption continues at the same rate.

Questions