

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

UESC Market Potential and FEMP Data Resources

New Utility Toolkit

June 25th 2021





Agenda

- Market Boundaries
- Market Potential
- Publicly available data
- Data Management & Reporting
- FEMP Data Resource Examples

- Federal customers within a utility service territory are eligible for UESC contracts
- UESC projects are Life Cycle Cost effective
- UESC terms may not exceed 25 years
- Market potential for UESCs is the potential for energy conservation measures (ECMs), renewable energy projects, and associated energy services at federal facilities

Where does the FEMP data set come from?

- EISA 432 requires federal agencies to identify "covered facilities" that constitute at least 75% of their total energy use
- A comprehensive evaluation for each covered facility must be completed at least once every 4 years
- Potential life-cycle cost-effective ECMs and implementation costs are identified during evaluations and reported to the EISA 432 Compliance Tracking System (CTS)
- Publicly Available Data from CTS is accessible:
 - Agency aggregates, representing all reported data subject to the EISA 432 requirements
 - Facility-level detailed data that excludes information for facilities that have requested exemption from public disclosure for national-security purposes



EISA 432 Evaluations – audit component

- EISA 432 comprehensive evaluations require a format based on ESPC preliminary assessment level audits
- A template for ESPC preliminary assessment reports can be found here in the link below: <u>https://www.energy.gov/eere/femp/downloads/20</u> <u>08-doe-idiq-espc-preliminary-assessment-template</u>

UESC Market Potential

- Several factors drive the market potential for ECMs and are supported by federal goals & mandates:
 - Energy efficiency
 - Greenhouse gas reduction
 - High performance sustainable buildings
 - Resilience
 - Renewable energy
 - Water & waste management
 - Performance contracting (Energy Act of 2020)
 - Administration policy

How to define UESC market potential with FEMP data



Target Market Characteristics – (CTS Defined Fields)

• Facility Location

- Filter by facility name, city, state, and zip code as applicable to utility service territory
- Some facilities (e.g. DOD) are exempt from facility level detail such as location

Building Type

- Use building type to understand make-up of locations, campuses, or geographic areas
- Date of Last Project Awarded
 - Can be associated with the Date of Last Evaluation to determine whether ECMs identified in the evaluation may have already been implemented

Project Funding Type

 Direct, ESPC, or UESC funding can indicate whether the location is familiar with performance contracting and the extent the funding type is utilized

Demand Characteristics – (CTS Defined Fields)

• Date of Last Evaluation

Time-stamp indicating how recently the evaluation (and associated ECM details) were updated

Potential Implementation Dollars

 The estimated investment of direct funding to implement the ECMs identified in the evaluation

• Potential Annual Energy Cost Savings

The total estimated energy-related savings associated with the last evaluation
 aggregate of all ECMs identified and all savings types (gas, electric, water, O&M)

Technology Category

 Type and count of ECMs identified in the evaluation - <u>not indicative</u> of the magnitude of energy and cost savings for each category type in the facility total

What data can be relevant for UESC programs?



Data Visualizations for Federal and Agency Aggregates



Office of Federal Sustainability Website

https://www.sustainability.gov/performance.html

- Key Feature: Visualizations
- Recommended reports:
 - Federal Government-Wide Investment in Facility Efficiency Improvements
 - <u>Agency Progress Data, Annual Sustainability Report and Implementation</u> <u>Plans, and OMB Scorecards</u>
 - Facility Energy Use
 - Water Use
 - Renewable Electricity
 - Facility Efficiency Investments

- High Performance Sustainable
 Buildings
- Fleet Petroleum and Alternative Fuels
- Greenhouse Gas Emissions

Energy Use, Cost, and Other Metric Reporting



Comprehensive Annual Energy Data and Sustainability Performance Website

 https://ctsedwweb.ee.doe.gov/Annual/Report/Rep ort.aspx

- Key Feature: pre-configured table reports
- Recommended reports:
 - <u>G-1 Investment in Energy Efficiency and Renewable Energy</u>
 - <u>G-2 Agency Investment in Efficiency and Conservation Projects by</u> <u>Funding Type</u>
 - <u>A-8 Site Delivered Energy Use and Costs by End Use and Energy Type</u> by Fiscal Year

Facility Level Detail for Ad-Hoc Analysis

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FEMP EISA 432 Data Warehouse

 https://ctsedwweb.ee.doe.gov/CTSDataAnalysis/D ataAnalysisTool/DataAnalysisTool.aspx

- Key Feature: Raw data set
- User configurable excel pivot tables:
 - Facility Annual Detail
 - Comprehensive Evaluation Detail
 - Benchmarked Building Detail
 - Project and Follow-up Detail

Office of Federal Sustainability Website (example)



Federal Government-Wide Investment in Facility Efficiency Improvements

FEMP Data Resource

https://www.sustainability.gov/government_data.html#investment

Comprehensive Annual Energy Data and Sustainability Performance Website (example)

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FEMP Data Resource

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https://ctsedwweb.ee.doe.gov/Annual/Report/Report.aspx

\$120

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\$500

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Treasury

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FEMP EISA 432 Data Warehouse (example)



Data Warehouse

A link to the CTS **Data Warehouse** is provided here to enable the public to analyze and generate custom reports of (restricted CTS data. The data warehouse consists of five data sets (or "data cubes") that may be used to build custom report module, including prior year records: **Facility Annual Detail, Comprehensive Evaluation Detail, Benchmarked Buildir** set, **Most Recent Facility Overview**, allows users to compare the most recent data from fields across all of the facility si data sets for research purposes.

You may connect to the CTS data warehouse via Excel using the following link: https://ctsedwweb.ee.doe.gov/CTSD

Notes:

- If you encounter an error when attempting to connect to the server, you may need to update your Microsoft Analysis Se
 - For a 32bit operating system, click: <u>http://go.microsoft.com/fwlink/?LinkID=188444&clcid=0x409</u>
 - For a 64bit operating system, click: <u>http://go.microsoft.com/fwlink/?LinkID=188445&clcid=0x409</u>
- The data cubes are presented on separate tabs within the workbook. If the field window does not immediately appear,

Use this guide for information on connecting "manually" using MS Excel: CTS_Data_Warehouse_Via_Excel.pdf

For additional help using Microsoft pivot tables, click here.

You may also connect directly to the CTS data warehouse with other data analysis tools using the following url as the Micrc https://ctsedwweb.ee.doe.gov/OLAP/msmdpump.dll

(Exempt facility information is excluded from publicly facing the Data Warehouse)

CTS Data Warehouse provides facility level detail in excel

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FEMP Data Resource

https://ctsedwweb.ee.doe.gov/CTSDataAnalysis/ComplianceOverv

iew.aspx

Using CTS Data for Market Potential

- CTS data can define trends in your service territory
- The following slides show examples of market potential analysis using CTS data

Agency Data Example – Building Types

Department of Veterans Affairs

Building Type	Annual Site Energy Use - MBtu
Hospital (General Medical & Surgical)	54,585,339
Hospital (General Medical and Surgical)	19,291,422
Medical Office	1,627,528
Other	36,634
Residential Care Facility	325,632
Urgent Care/Clinic/Other Outpatient	478,649

Department of Energy					
Building Type	Annual Site Energy Use - MBtu				
Other	123,885,399				
Office	9,481,997				
Laboratory	3,293,242				
Data Center	2,840,647				
Other - Technology/Science	1,459,520				
Other - (48 remaining types combined)	3,398,953				

General Services Administration					
Building Type	Annual Site Energy Use - MBtu				
Office	57,419,815				
Courthouse	10,475,030				
Other	1,627,191				
Data Center	531,892				
Non-Refrigerated Warehouse	387,105				
Other - (6 remaining types combined)	556,250				

- Building Types can be filtered by utility service territory
- Emphasize project experience based on agency building type

Agency Data Example – VA Potential ECMs





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Lighting Improvements	Boiler Plant Improvements	HVAC	Sewer Conservatio	Envel Modifi	E S	Ot	R A	E D	Ξ

- EISA 432 comprehensive evaluations provide a count of ECMs by category •
- Individual ECMs are not directly associated with magnitude of potential energy ۲ savings, implementation cost, or cost savings
- Most of the VA facilities are hospitals •

Agency Data Example – DOE Potential ECMs



- Different agencies have different potential ECMs based on their facility operations
- For this example, no single ECM technology category dominates the potential opportunities for the DOE

Agency Data Example – GSA Potential ECMs





- The GSA owns and leases over 9,600 buildings (https://www.gsa.gov/realestate/gsa-properties)
- Building Envelope Modifications is the most frequent potential ECM for the GSA
- Building Envelop Modifications reflect the most prominent building type in the GSA which is offices, but also may be due to the GSA having already implemented the more cost effective ECMs such as lighting

Multiple Facility Analysis – data warehouse



- The date of the last evaluation will indicate how current the data is for each facility
- Facilities can be filtered by zip code, city, state, or address
- Consider offering your customer a UESC Preliminary Assessment that conforms with the required EISA Evaluation if they are due for a renewed evaluation

Single Facility Analysis – data warehouse

Most Recent Facility Overview	201	L6-06-15
Potential Annual Energy Cost Savings - Dollars	\$	50,477
Potential Annual Energy Savings - MBtu		545 <i>,</i> 305
Potential Annual Water Cost Savings - Dollars	\$	174,300
Potential Annual Water Savings - Thou Gallons		131,951
Potential ECM - Advanced Metering Systems		1
Potential ECM - Building Envelope Modifications		3
Potential ECM - Commissioning Measures		1
Potential ECM - HVAC		2
Potential ECM - Lighting Improvements		1
Potential ECM - Other		3
Potential ECM - Water And Sewer Conservation Systems		5
Potential Implementation Cost Of Measures - Dollars	\$	2,633,889

- Most recent facility overview was updated in 2016 and date of last project awarded was in 2014
- The facility is due to provide another cycle of the EISA 432
 - Evaluation reporting

Date of Last Project Awarded	20	14-01-01
Energy Savings Performance Contract Funding - Dollars	\$	77,225,284
Other Funding - Dollars	\$	334,000
Total Project Implementation Cost - Dollars	\$	77,559,284
Utility Energy Service Contract Funding - Dollars		0
Direct Centralized Capital Funding - Dollars		0

- Last project awarded in 2014 was a \$77M ESPC
- The facility is familiar with performance contracting and may be open to considering a UESC
- A preliminary assessment could be offered to cover the next required EISA Evaluation

Final thoughts

- Publicly available data can be accessed and used to assess market potential for ECMs
- Funding type will indicate whether performance contracting has been used in past ECM investments by agency, service territory, or location
- Depending on your UESC market, you can view broad trends by geography and agency, or assess individual facility details through the data warehouse
- For facilities exempt from public CTS reporting (such as DOD), agency level data can be used characterize the market until site level detail is provided by customers