



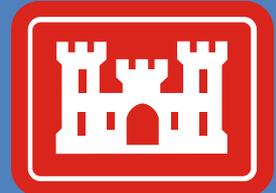
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A River of Energy Solutions

Session 4 Project Identification: Let's Get Started

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Project Identification Steps

- Understand Energy Goals
- Pick Your Survey Level (I, II or III)
- Project Identification Tools
- Baselines and Planning
- Baseline Tools
- Funding Options / Bang for the Buck
- Partnerships
- Measurement & Verification (M&V)
- Life Cycle Cost
- Strategize – Funding Options

Project Identification

- Understanding Energy Goals
- Determining Best Projects to Implement
- Baselineing
- Making Smart Project Selections
- Ensuring Right Project Selection
(Measurement and Verification)

Project Identification

Understanding Energy Goals



Objective

- Achieve energy goals by
 - identifying energy conservation projects
- to eliminate energy waste at Federal facilities

AR 420-1

Project Identification

Determining Best Projects: Right Level of Survey

- Holistic assessment of all facilities on installation?
- In-depth analysis with investment grade project development?
- Detailed engineering analysis (investment, performance M&V assessment, and fully instrumented diagnostic measurements?)

Project Identification

Determining Best Projects: Right Level of Survey

- **Level I Audit** (qualitative analysis)
 - Holistic, preliminary energy and process optimization opportunity analysis
 - Walk-through takes two to five days
 - Identifies the bottom-line dollar potential of energy conservation and process improvements

Project Identification

Determining Best Projects: Right Level of Survey

- Level 1 Projects
- Low to Moderate Investment Cost Projects (less than \$25K Investment)
- Moderate Investment Cost (\$25K – \$150K)
- Significant Investment Cost (\$150K & Above)
- Renewable Technology
- Maintenance Projects
- Level II Analysis Required

Project Identification

Determining Best Projects: Right Level of Survey

- **Level II Audit** (quantitative analysis)
 - Uses calculated savings and partial instrumentation measurements with a cursory level of analysis.
 - Typically takes five to ten times the effort of a Level I
 - Accomplished over a two to six-month period.
 - In-depth analysis in which the most crucial assumptions are verified
 - End product will be a group of “appropriation grade” energy and process improvement projects for funding and investment

Project Identification

Determining Best Projects: Right Level of Survey

- **Level III Audit** (continuous commissioning)
 - A detailed engineering analysis which includes investment, performance Measurement and Verification (M&V) assessment, and fully instrumented diagnostic measurements (long term measurements)
 - Takes 3 to 18 months to accomplish.

Project Identification



1. Prioritize Facilities for Survey



2. Gather data / Assess expertise needed
(includes metering and utility data)



3. Survey



4. Report Delivery / Capital Investment
Strategy

Identification Tools



1. Energy Assessment - Enhances installation awareness of energy and water related issues. Finds conservation measures.



2. Report – Documents installation energy and water status; identifies conservation opportunities.



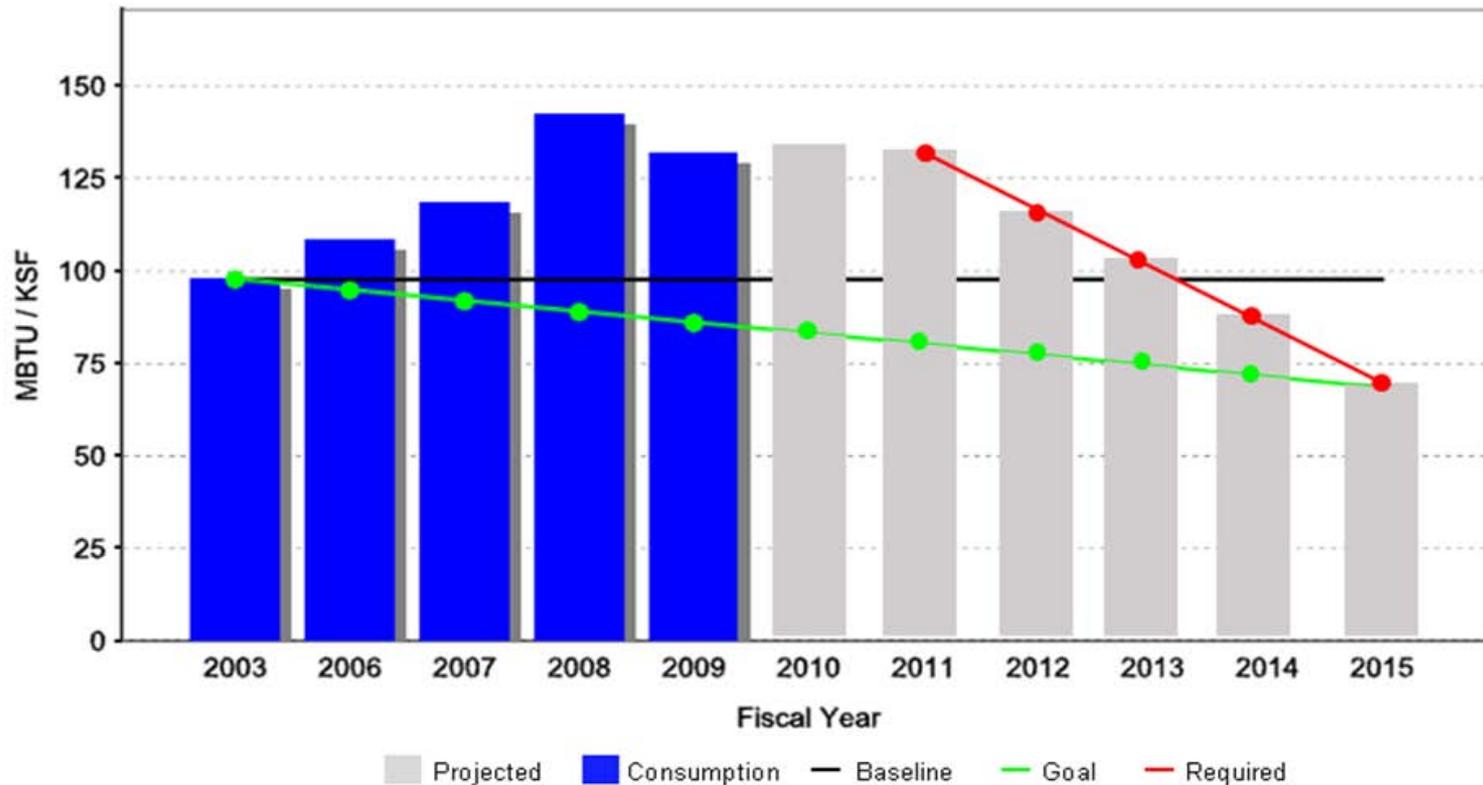
3. Capital Investment Strategy – Provides a framework for making decisions on development and implementation of projects. Helps in analysis of priorities.



4. DD1391s – Prepared for submission for ECIP funding.

Baseline

Know where you are...know where you are going



Baseline Tools



1. Army Energy and Water Reporting System (AEWRS)

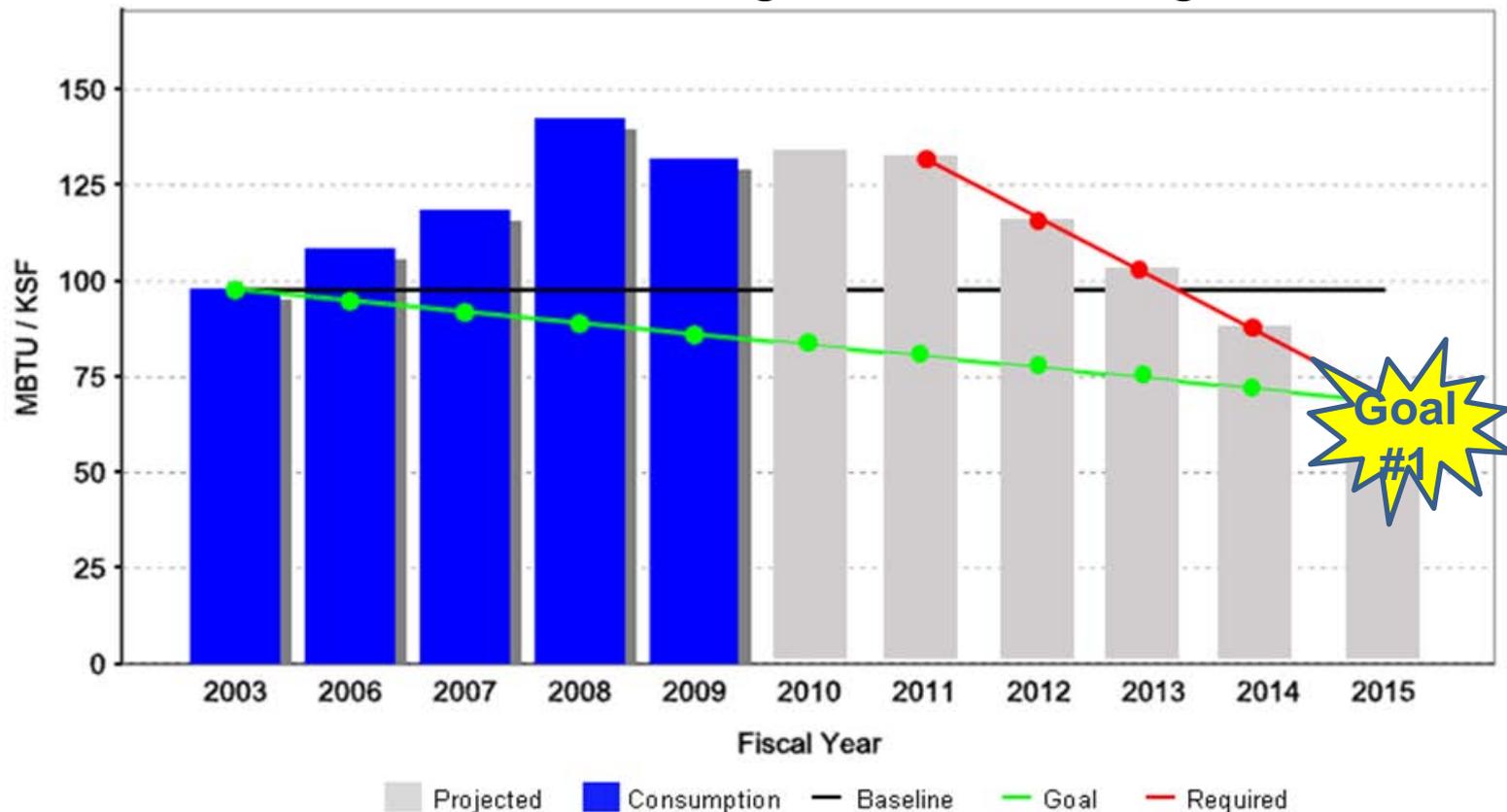


2. Utility Monitoring and Control Systems (UMCS)/Electronic Monitoring and Control Systems (EMCS)



3. Metering Data (Electric, Gas, Water)

Smart Projects: Strategize Baselining and Planning



**Army Energy and Water Campaign Plan for Installations
EPACT 05; EO 13423; EO 13514; and EISA 07**

Smart Projects: Strategize

Analysis by Funds

Fiscal Year	Required Savings (%)	Required Savings (MMBtu)	Anticipated Savings (MMBtu)	Investment Required (\$ M)	Estimated Energy Consumption (MMBtu)	MMBtu/KSF
FY11	NA	-	-	\$938,757	288,600	130
FY12	11.8%	34,084	22,415	\$1,451,447	266,185	120
FY13	11.8%	34,084	19,171	\$1,894,623	247,014	111
FY14	11.8%	34,084	20,807	\$923,406	226,208	102
FY15	11.8%	34,084	28,434	\$0	197,774	89
Totals:	47.2%	136,336	90,826	\$5,208,231	1,514,381	-

Smart Projects: Strategize

- What can you afford?
 - Operation and Maintenance (SRM)
- Other funding resources?
 - ECIP
 - Military Construction, Army (MILCON/MCA)
 - Third Party Financing - Energy Savings Performance Contract (ESPC), Enhanced Use Lease (EUL), PPA (Power Purchase Agreement), pilot projects



Smart Projects: Strategize

Bang for Your Buck

- Savings-to-Investment Ratio
- MMBtUs Saved
- Mission
- Master Planning
- Execution/Implementation Risks
- Partnership



Smart Projects: Strategize

- Prioritize projects according to funding source and SIR
 - Your money – What yields the highest SIR now
 - ECIP (funding typically over \$750K)
 - MCA (funding over \$750K)
 - ESPC (typically requires more analysis/studies and has a low or unknown SIR)



Smart Projects: Strategize

Analysis by Conservation Measure

Category	FY11	FY12		FY13		FY14		FY15		Total	
	Investment	Savings	Investment	Savings	Investment	Savings	Investment	Savings	Investment	Savings	Investment
Building Envelope	\$672,922	14,429	\$484,107	7,529	\$484,107	7,529	\$541,507	7,815	\$0	37,302	\$2,182,644
Domestic Water Heating	\$11,161	1,643	\$0	0	\$255,591	3,191	0	0	\$0	4,834	\$266,752
HVAC	\$26,480	1,997	\$835,884	9,885	\$1,023,469	8,331	\$250,443	18,862	\$0	39,075	\$2,136,276
Lighting	\$106,663	2,401	\$0	0	\$0	0			\$0	2,401	\$106,663
Renewable Tech.	\$13,000	189	\$0	0	\$0	0			\$0	189	\$13,000
Replace Upon Failure	\$131,455	1,756	\$131,455	1,756	\$131,455	1,756	\$131,455	1,756	\$0	7,026	\$525,821
Totals:	\$961,682	22,415	\$1,451,447	19,171	\$1,894,623	20,807	\$923,406	28,434	\$0	90,826	\$5,231,156

Smart Projects: Strategize

Analysis by System

Bldg Name	Description	Total Energy Savings		Total Savings (\$)	Invest. (\$)	Est. SIR	Implementation Strategy
		MMBtu/Yr	\$/Yr				
Bldgs 4981, 4982, 4499	Install Variable Frequency Drives for Systems that Incorporate Variable Volume Flow	260	\$5,329	\$5,329	\$18,750	3.3	SRM
Administration	Replace Inefficient Temporary Equipment	127	\$2,596	\$2,596	\$13,500	2.2	SRM
DFAC	High Efficient Electronically Communicated Motors on Evaporator Coils in Walk-in Coolers	24	\$502	\$502	\$2,000	2.9	SRM
Warehouse	Reduce Number of Doors	5,152	\$46,368	\$46,368	\$174,368	4.4	ECIP Bundle
Chiller Plant	VFD for Chilled Water Distribution Pumps	577	\$11,844	\$11,844	\$36,000	7.0	ECIP Bundle
Chiller Plant	Chiller Isolation Valves and Load Based Operation	459	\$9,408	\$9,408	\$38,100	5.3	ECIP Bundle
Bldgs 5300, thru 5305	Implement Automatic Adjustment of Heating/Cooling Supply Water Temperature Set-point	1,089	\$14,986	\$14,986	\$27,750	6.2	ECIP Bundle

Smart Projects: Strategize

BOTTOM LINE...

Capital Investment should target priority facilities and projects that optimize energy and water consumption reduction

Smart Projects: Strategize

- Leverage Expertise and Capabilities
- Create working relationship within IMCOM, Garrison Commanders, DPWs, Energy Managers, NECs and Resource Efficiency Managers
- Vendors, Third Party Finance
- USACE (HNC and CERL), DOE Labs

Ensuring Right Project Selection

What is Measurement & Verification?

- An established process for assessing the effectiveness of energy efficiency and demand response projects.

Ensuring Right Project Selection

Measurement & Verification

- Collecting and analyzing energy data is fundamental to any task of determining energy performance.
- No efficiency project is complete until the claimed savings have been demonstrated and validated through standard measurement and verification (M&V) protocols.

Ensuring Right Project Selection Measurement & Verification

Steps to Determine and Verify Savings

Step 1: Allocate Project Responsibilities

Step 2: Develop a Project-Specific M&V Plan

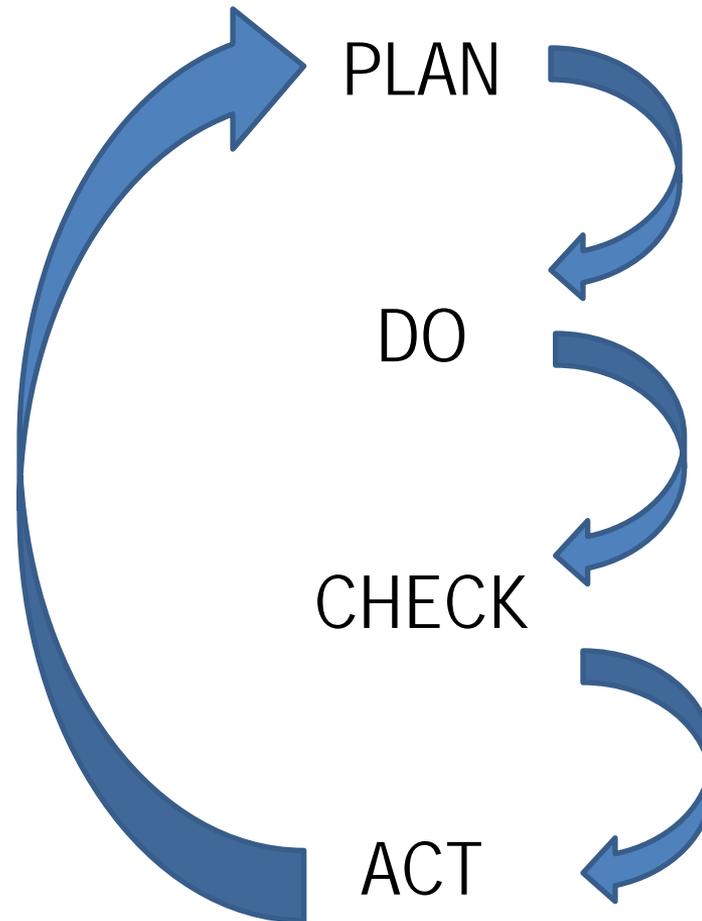
Step 3: Define the Baseline

Step 4: Install / Commission Equipment and Systems

Step 5: Conduct Post-Installation Verification Activities

Step 6: Perform Regular-Interval Verification Activities

Ensuring Right Project Selection STRATEGY LIFE CYCLE?



Project Identification

<http://pps.hqda.pentagon.mil>

<https://pax.mech.disa.mil>

https://army-energy.hqda.pentagon.mil/policies/ecip_guidance.asp

https://eko.usace.army.mil/virtualteams/hnc_energy/

http://www1.eere.energy.gov/femp/pdfs/mv_guidelines.pdf

Questions

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