National Association of Energy Service Companies

Timothy D. Unruh, PhD, PE, CEM, LEED-AP

NAESCO National Association of Energy Service Companies

AD ASTRA PER ASPERA
Kansas
Corporation Commission

NAESCO – Who are we?

- A non-profit trade association advocating for the energy service company market
- In existence since 1983
- Membership of 98 companies
- Home of the only Energy Service Company (ESCO) Accreditation
- 30 Accredited ESCOs
- ESCO industry is about $7-8 Billion Annual Spend

Accreditation

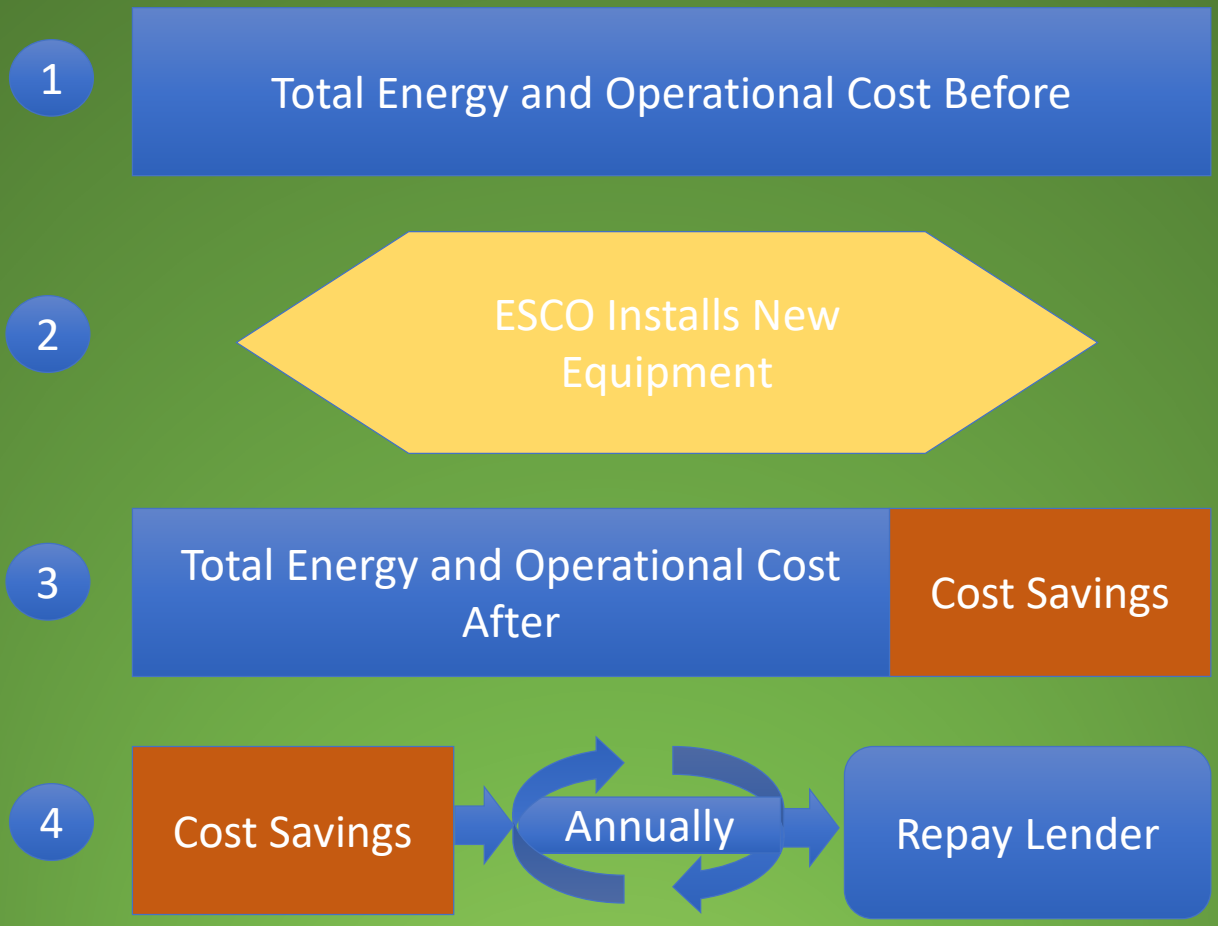
- A rigorous process of evaluation performed by an independent committee of reviewers
  - Financial Review
  - Project Review
  - Savings Achievement Assessment
  - Interviews with Site Personnel
  - Legal History Review
- Provides an additional assurance of ESCO Performance

What is this all about?

- Energy Performance Contract (EPC)
- Energy Service Company (ESCO)
- Measurement and Verification (M&V)

- A contract that repurposes money wasted on energy and operational expenses
- A Company that develops a scope of work to install building improvements that will save money and energy
- A process of evaluating the performance of equipment installed that is intended to save money

How does this work



NAESCO National Association of Energy Service Companies

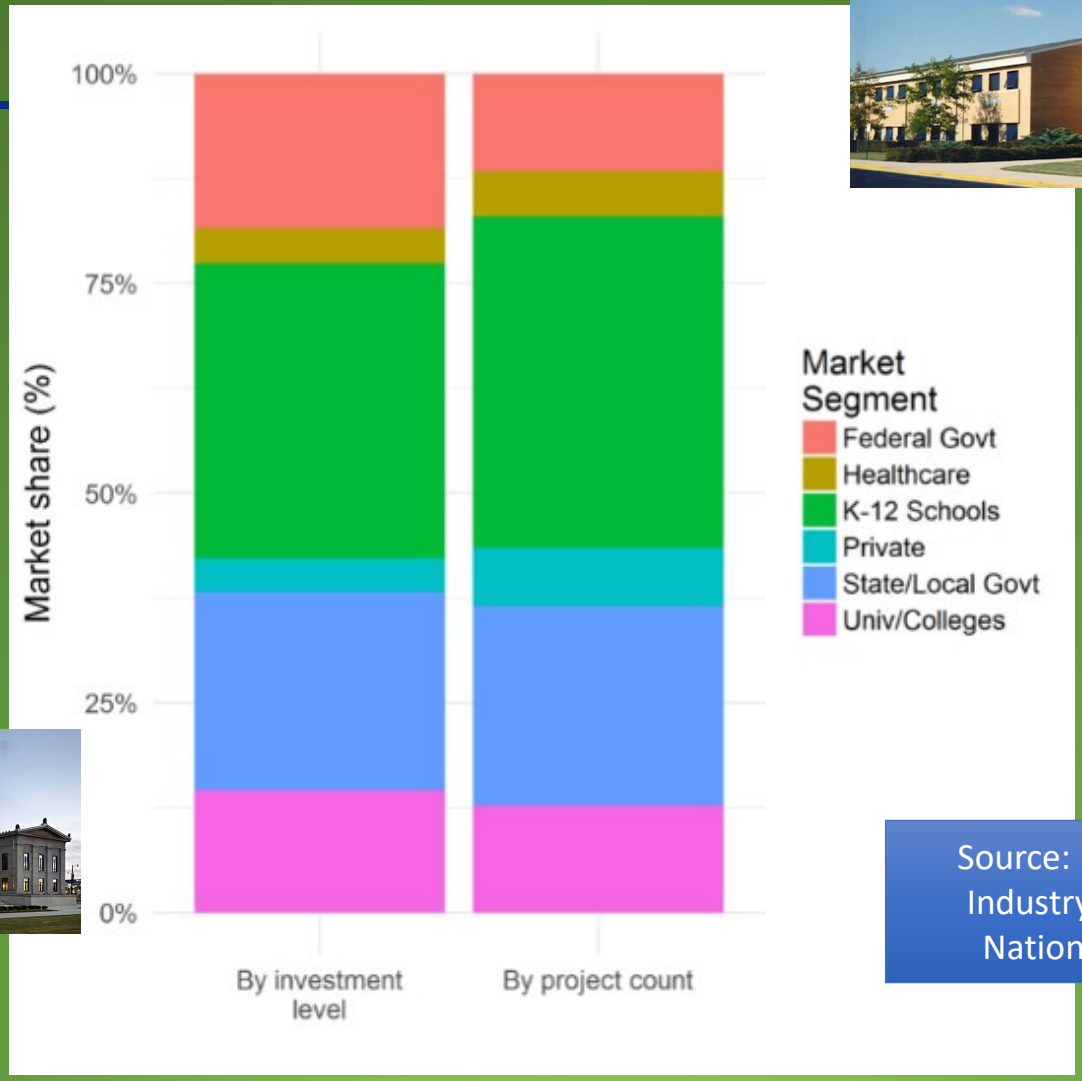
What is the process?

- Step 1: ESCO and Client Discuss Needs
- Step 2: Preliminary Analysis to Determine Potential
- Step 3: ESCO and Client Refine Needs
- Step 4: Investment Grade Audit
- Step 5: Negotiate Final Scope of Work to Contracts
- Step 6: Construct the Project
- Step 7: Annually Assess Performance

Who uses EPCs?

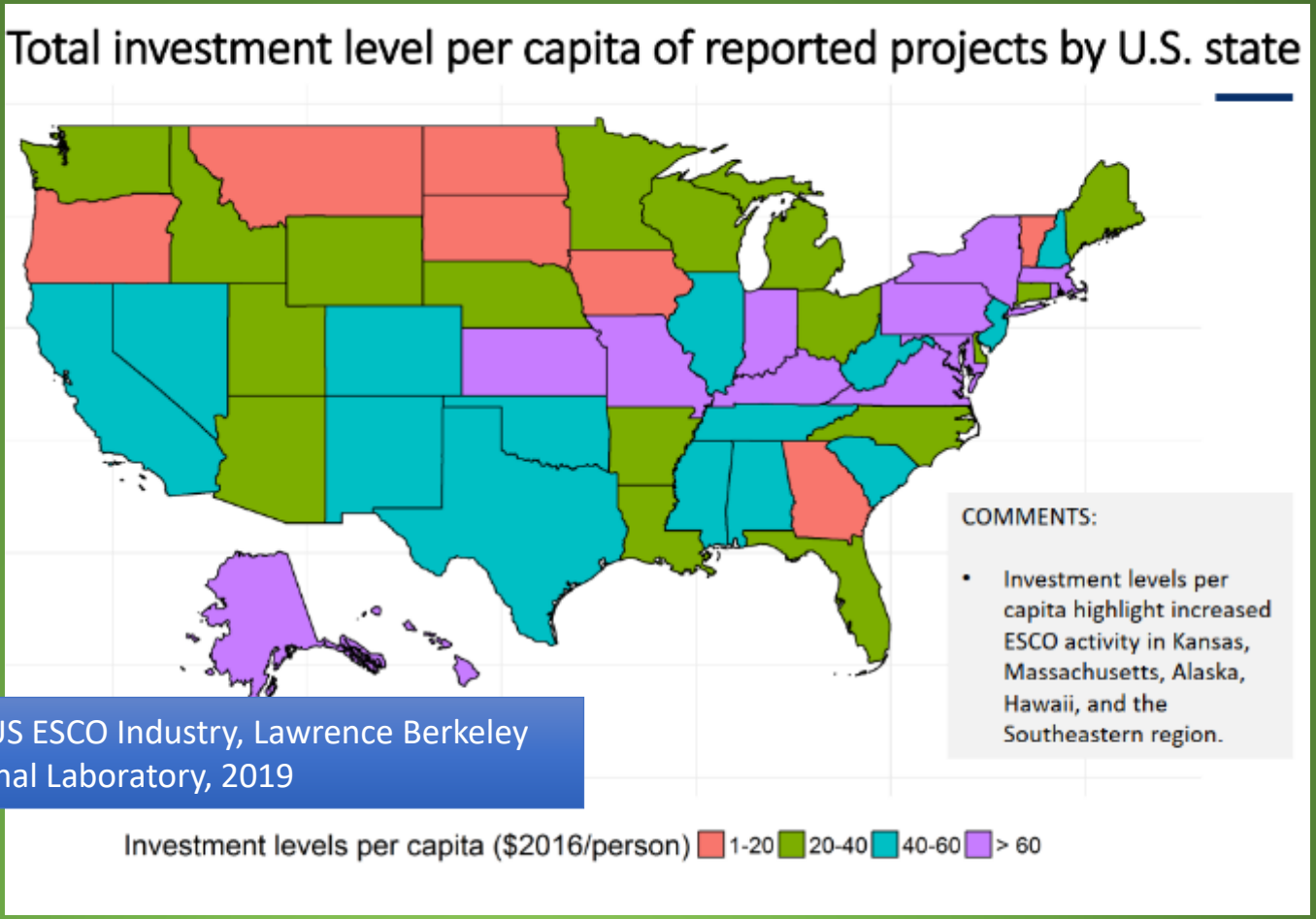
- A term called the “MUSH” market is the predominant user of Energy Performance Contracts
  - M – Municipal Governments
  - U – Universities and Higher Education
  - S – School Systems
  - H – Hospitals
- These contracts are used by these entities because they have “enabling legislation” that allows them to redirect existing budget dollars into a new use
- The MUSH market often has challenges to acquire the money to do building improvements

Who uses EPCs?

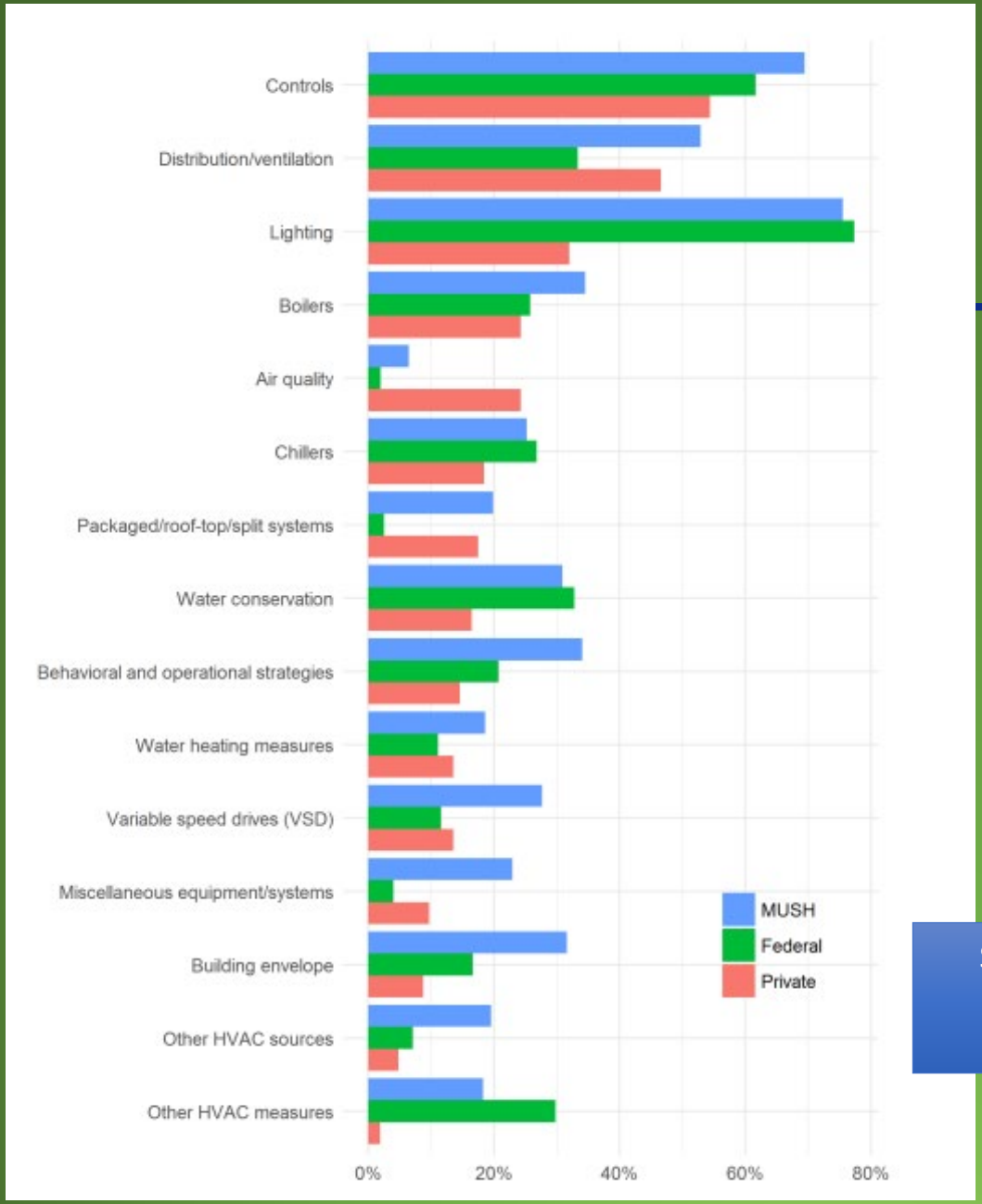


Source: State of the US ESCO Industry, Lawrence Berkeley National Laboratory, 2019

Where are they done?



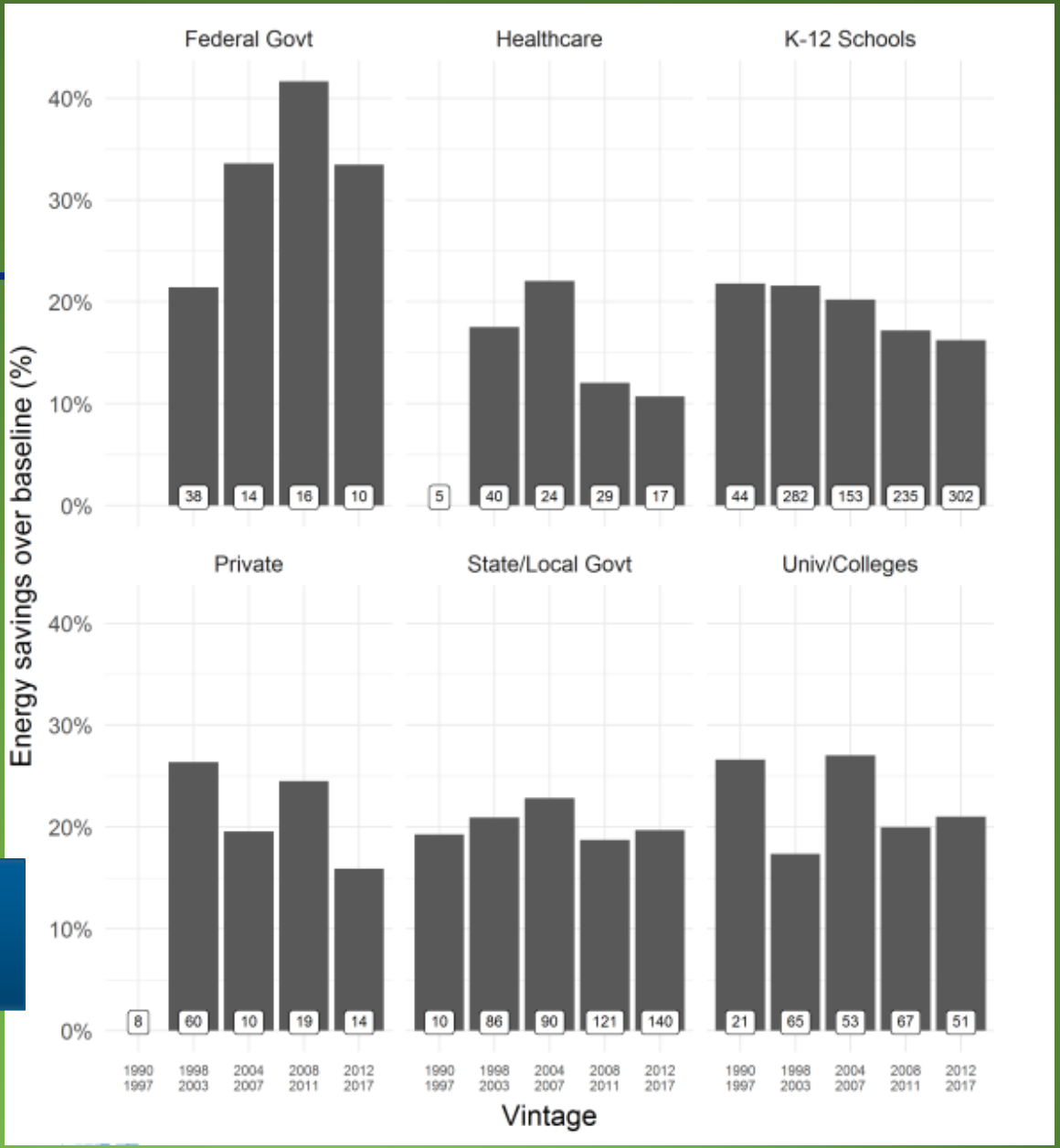
Source: State of the US ESCO Industry, Lawrence Berkeley National Laboratory, 2019



What is being installed with EPCs?

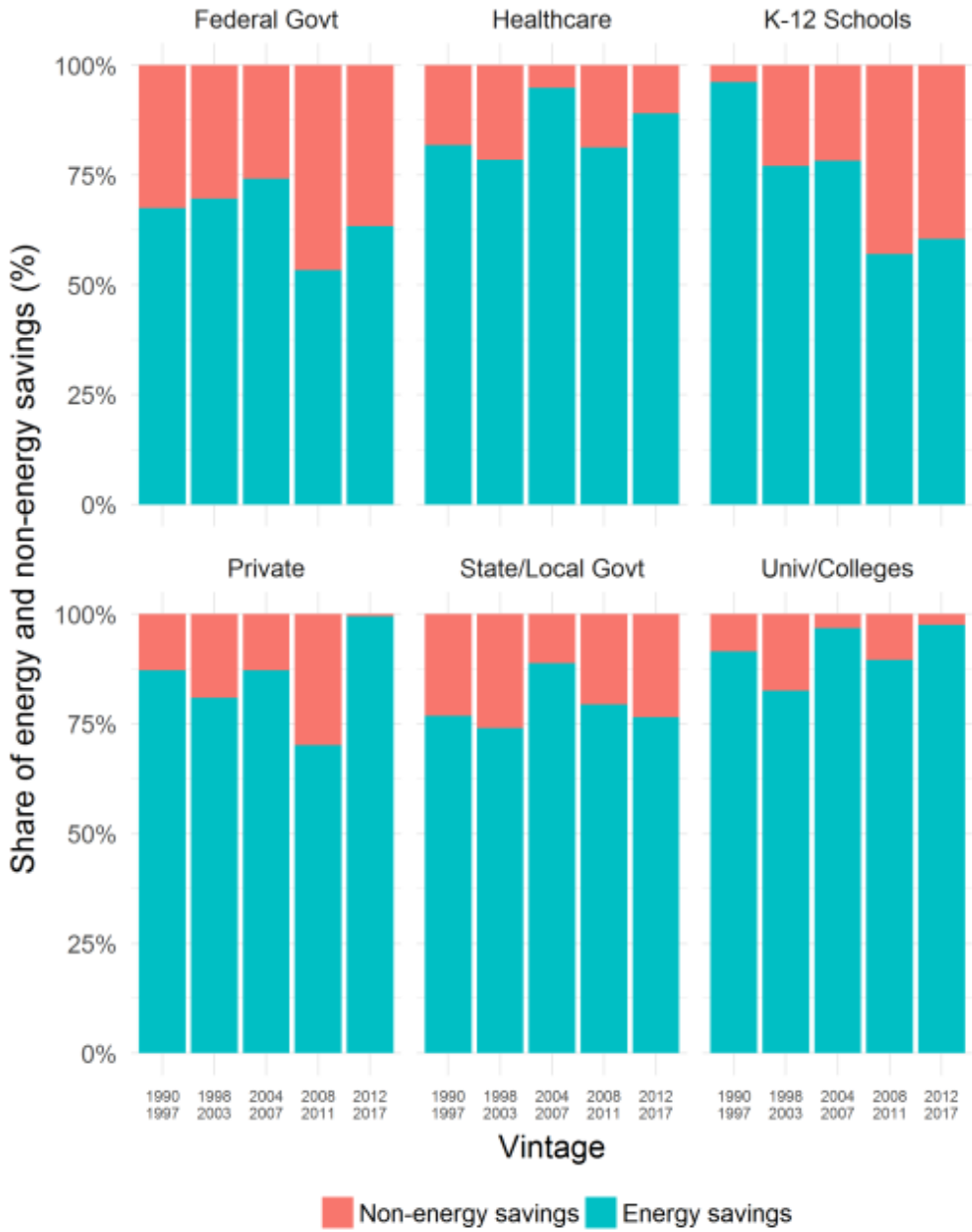
Source: State of the US ESCO Industry, Lawrence Berkeley National Laboratory, 2019

How much Energy is Saved?



Source: State of the US ESCO Industry, Lawrence Berkeley National Laboratory, 2019

Operational Savings



Source: State of the US ESCO Industry, Lawrence Berkeley National Laboratory, 2019

NAESCO National Association of Energy Service Companies

Why are EPCs used?

You want to eliminate waste

People are cold

Things just need to be turned off

It just seemed like a good idea

Equipment is Broken

This is the only way to get money

NAESCO National Association of Energy Service Companies

Some key things to know

- Audits
- Payback
- Cash Flow Proforma
- Energy Savings
- Energy Rates
- Energy Rate Escalation
- Operational and Maintenance Savings
- Risk and Responsibility
- Construction Savings
- Schedule
- Project Closeout
- Performance Period
- Measurement & Verification
- Warranty

Audits

Preliminary

- Done at no cost to client
- Short few hours at site
- Estimated Savings
- No Contractor Bids, Estimated Costs
- Used to determine if further action is warranted
- Product is a project profile

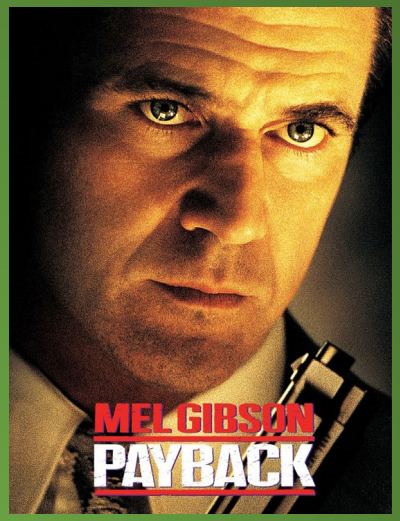
Investment Grade

- Done at cost to client
- Duration of 2-6 months
- Guaranteed Savings
- Contractor Bids, Guaranteed Costs
- Used to establish the scope of the work agreement
- Intended Product is an EPC

Payback

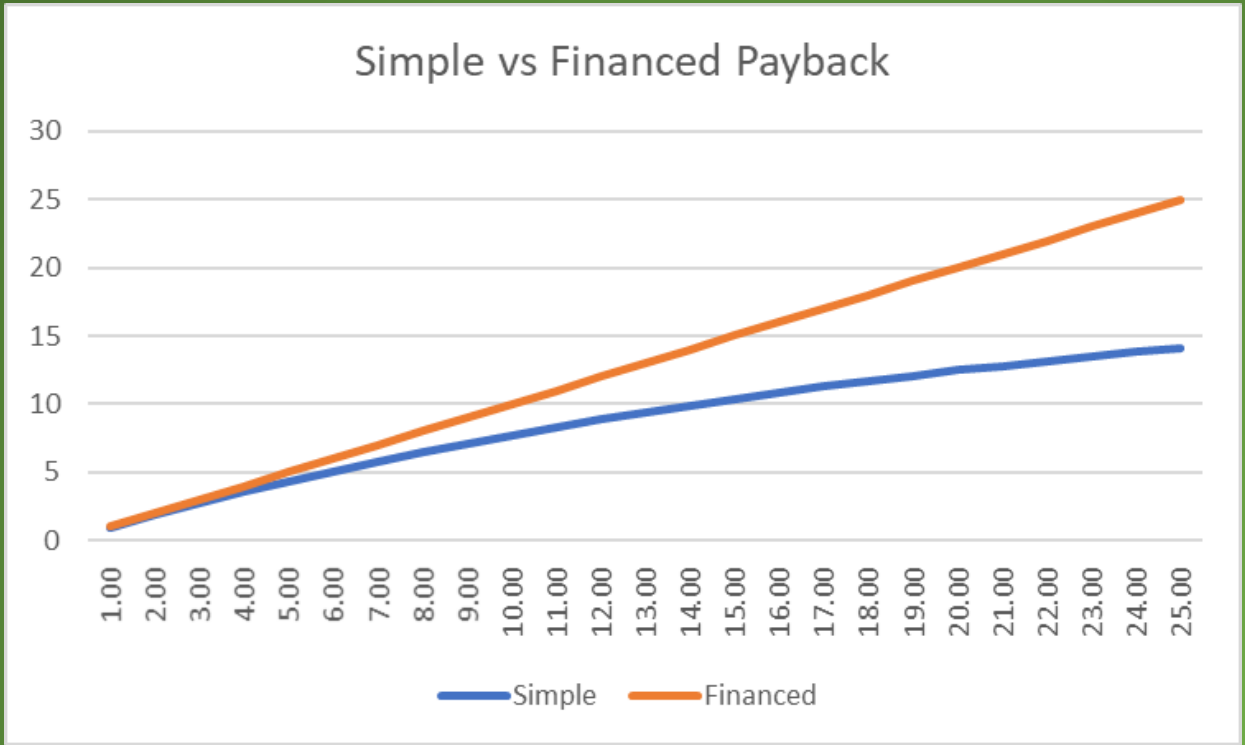
- Project Information:
  - Interest Rate = 5%
  - Desired Project Duration = 15 Years
- So, Financed Project Payback = 15 Years
- Simple Project Payback:
  - Simple Project Payback = 10.37 years

$$\frac{[(1+\text{int})^{n}-1]}{[(1+\text{int})^{n}\times \text{int}]}$$



- Simple: A ratio of the cost divided by the savings
  - Cost of $1,000, Savings of $100/year
  - Payback = 10 years

Project Length Considerations



As project duration increases, more of the savings must pay for interest on the loan amount

Cash Flow Proforma

- A numeric description of the project over the duration of the project.

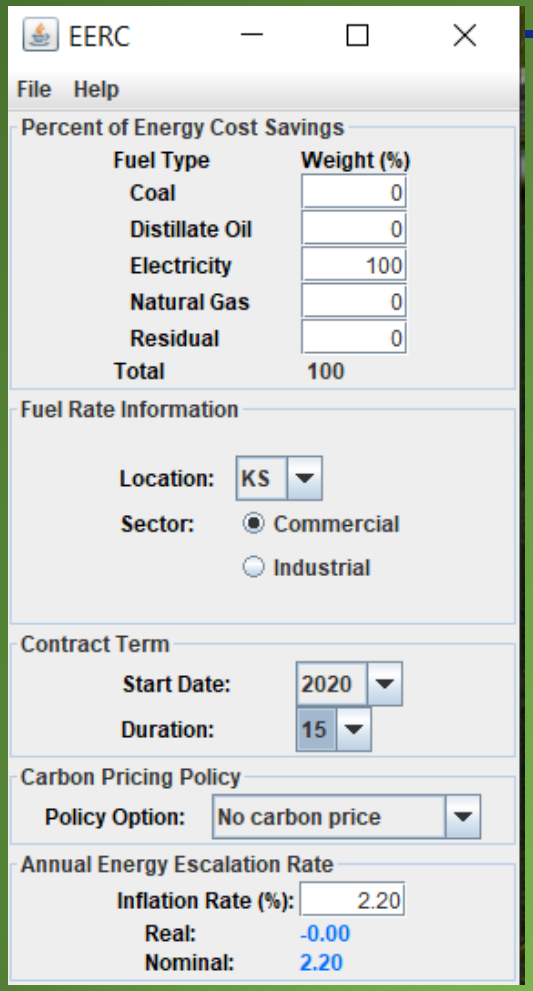
YEAR	PROJECTED UTILITY COST SAVINGS	GUARANTEED UTILITY SAVINGS	OPERATIONAL & MAINTENANCE COST SAVINGS	BUDGET CONTRIBUTION	FUNDS AVAILABLE	DEBT SERVICE	EXCESS SAVINGS	TECHNICAL SERVICE PAYMENTS
Construction	$0	$0	$0	$0	$0	$7,410	($7,410)	$0
1	$0	$0	$0	$0	$0	$47,045	($47,045)	$40,000
2	$0	$0	$0	$0	$0	$47,045	($47,045)	$41,200
3	$0	$0	$0	$0	$0	$47,045	($47,045)	$42,436
4	$0	$0	$0	$0	$0	$47,045	($47,045)	$43,709
5	$0	$0	$0	$0	$0	$47,045	($47,045)	$45,020
6	$0	$0	$0	$0	$0	$47,045	($47,045)	$46,371
7	$0	$0	$0	$0	$0	$47,045	($47,045)	$47,762
8	$0	$0	$0	$0	$0	$47,045	($47,045)	$49,195
9	$0	$0	$0	$0	$0	$47,045	($47,045)	$50,671
10	$0	$0	$0	$0	$0	$47,045	($47,045)	$52,191
11	$0	$0	$0	$0	$0	$47,045	($47,045)	$53,757
12	$0	$0	$0	$0	$0	$47,045	($47,045)	$55,369
13	$0	$0	$0	$0	$0	$47,045	($47,045)	$57,030
14	$0	$0	$0	$0	$0	$47,045	($47,045)	$58,741
15	$0	$0	$0	$0	$0	$47,045	($47,045)	$60,504
16	$0	$0	$0	$0	$0	$47,045	($47,045)	$62,319
17	$0	$0	$0	$0	$0	$47,045	($47,045)	$64,188
18	$0	$0	$0	$0	$0	$47,045	($47,045)	$66,114
19	$0	$0	$0	$0	$0	$47,045	($47,045)	$68,097
20	$0	$0	$0	$0	$0	$47,045	($47,045)	$70,140
TOTALS	$0	$0	$0	$0	$0	$940,893	($940,893)	$1,074,814

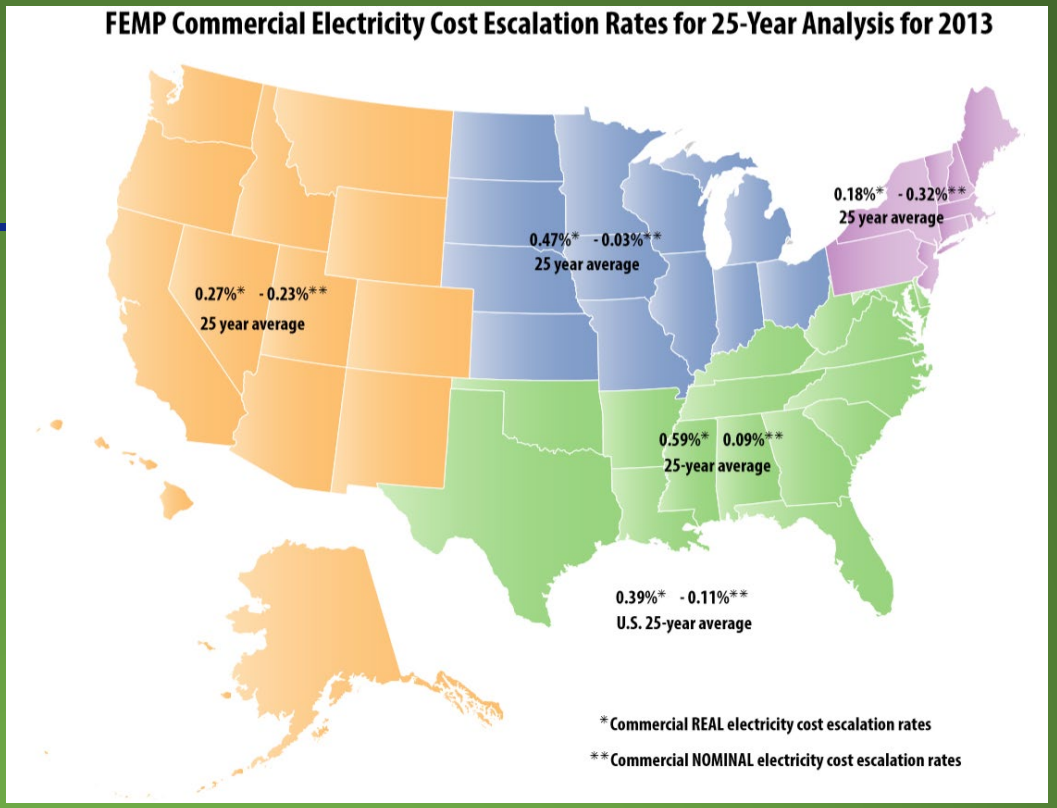
- The cash flow proforma outlines the costs incurred each year of the agreement, as well as the offsetting savings to justify the costs.

Energy Savings and Rates

- Energy savings is the amount of **energy** (kWh, Btu, therms, MCF, ton-hours, etc.) that will be reduced by the project
- Rates convert the energy units saved into dollar savings
- Electric rates often have a time-of-use factor included, that can be time-of-day OR seasonal, or BOTH.
- Electric Demand rates are always time-sensitive
- Some electric savings may be in Power Factor improvement

Energy Rate Escalation





- While rates DO go up, the escalation factor you choose can have a large impact on the project
- Escalation rates should be carefully considered.

Operational and Maintenance Savings

- Operational and Maintenance Savings (O&M) can be included in savings for a project
- Savings must have clear documentation and substantiation
- Be careful about personnel savings in a project to ensure that it is real
- Measuring and verifying O&M savings relies upon the documentation you establish during the project audit

Risk and Responsibility

- Sometimes called the Risk-Responsibility Matrix
- Identifies who is responsible for things that happen during the contract
- Can cover construction issues as well as performance period issues
- Example: If the operational hours increase from those established in the original agreement, who is responsible for the additional energy consumed due to these increased hours?
- Example: Who is responsible for equipment failures after the manufacturer warranty has expired, but still within the performance period?

Construction Savings

- During construction, some savings will begin to accrue due to some scope of work being completed, while other scope of work is yet to be started.

- Lighting savings are installed at the beginning of a project will produce significant savings.

Schedule and Project Closeout

- Schedule – 2 different ones during entire project
  - Audit Schedule – how long will it take, may be key to complete on-time to ensure construction fits seasonal needs
  - Construction Schedule – crucial, as financing repayments may be tied to on-time completion
- Project Closeout
  - Substantial Completion – client gets beneficial use of equipment, punch list of remaining items is created
  - Warranty – typically starts at beneficial use/Substantial Completion, may be different for each ECM
  - Final Completion – punch list is done, savings guarantee begins

Performance Period

- Begins at Final Completion
- Warranty Fulfillment
- Measurement and Verification
- Ongoing Services Provided by ESCO
- Maintenance done by client begins
- Operation according to agreement

Measurement and Verification

- Various types that can occur
  - Option A – Partially Measured
  - Option B – Fully Measured
  - Option C – Utility Bill
  - Option D – Models
- Process of gathering data varies
  - Spot measurements
  - Ongoing measurements (ie from Building Control System)
- Annual report of savings and project status
  - Guarantee reconciliation

Warranty

- Typical construction projects include 1-year of warranty on installed equipment
- Larger single point equipment often can have extended warranty included (ask for it if you want it)
- Performance Guarantee does not equal equipment guarantee

Timothy D. Unruh

timothy.unruh@naesco.org

NAESCO National Association of Energy Service Companies

Kansas Corporation Commission