

Tribal Energy Project Development through ESCOs



**Tribal Energy Program
Webinar**

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LEED AP**

&

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Welcome!

Tribal Energy Project Development Through ESCOs

Tribal Energy Program Webinar

April 21, 2010

3:00 PM – 4:30 PM EST



Please mute your phones as a courtesy to the other listeners. Do not place your phone on hold; instead, hang up and dial in again if necessary.

There will be time for questions at the end of the presentation.

Agenda

- What is an ESCO?
- ESPC Basics
- History of ESPC
- Business Models/ Approaches to ESPC
- Challenges in Tribal Country
- Project Examples
- How to Get Started
- Review
- Question & Answer Session



What is an ESCO?

A company with the expertise and ability to:

- identify energy efficiency and renewable energy conservation measures from existing plant and equipment in office buildings, schools, warehouses, hospitals, casinos, residences, and other potential locations;
- secure financing on behalf of the customer;
- install, operate, and maintain installed measures; and
- **guarantee** the resultant energy savings and energy-related cost savings associated with the newly installed retrofits over the contract term.

Who are the ESCOs?

ESCO: Energy Service Company

Dept of Energy IDIQ

- Ameresco
- Benham
- Chevron
- Clark Realty Builders
- Consolidated Edison
- Constellation Energy
- FPL
- Honeywell
- JCI
- Lockheed Martin
- McKinstry Essention
- Noresco
- Pepco
- Siemens
- TAC Energy Solutions
- Trane



Key:

Black = unique to contract
Blue = common to both contracts

Dept of Defense IDIQ

- AECOM
- Ameresco
- Benham
- Burns MacDonald
- Chevron
- Consolidated Edison
- Constellation Energy
- FPL
- Honeywell
- JCI
- Noresco
- Pepco
- SEI Group
- Siemens
- Trane

ESCOs listed in alphabetical order

ESPC Basics: Introduction

ESPCs are **Energy Savings Performance Contracts**:

The contracting mechanism by which an ESCO works with a customer to identify energy saving retrofits, secure financing, install measures, address risk and responsibility, guarantee savings, measure and verify realized savings, and be assured of repayment for their capital investment if equipment performs.

ESCOs are re-paid through energy and energy-related cost savings that result from installed energy conservation measures or improvements to existing plant and equipment, reflected as utility savings, operations and maintenance savings, and other avoided costs.

ESPC Basics: Definition of ESPC



- A **contract** between the Agency and Energy Service Company (ESCO)
- **No up-front cost** contracting method
 - ESCO incurs the cost of implementing energy conservation measures (ECMs)
- **ESCO guarantees** the energy, water, and operations savings resulting from the ECMs
 - ESCO is **paid from \$ savings**



ESPC Basics: Legal Requirements

Four Key Points about Federal ESPCs:

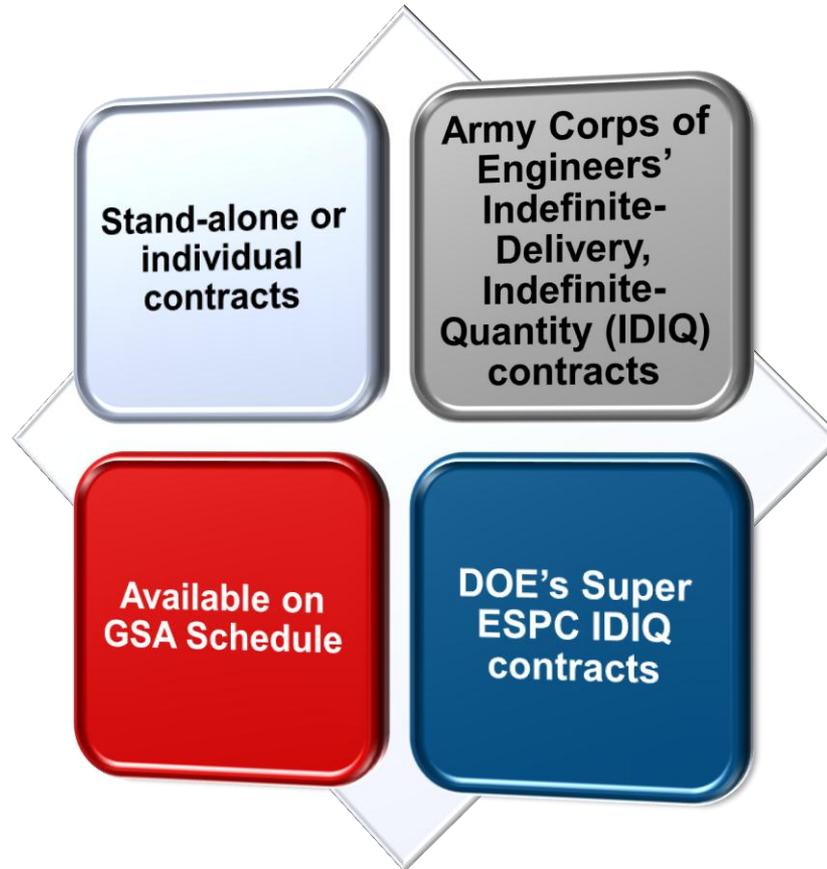
1. Savings guarantees are mandatory
2. Measurement and Verification (M&V) of savings is mandatory
3. Savings must exceed payments in each year
4. Contract term cannot exceed 25 years



ESPC Basics: Approaches

Business as usual:

- Synopsis
- Request for Proposal
- Solicitation
- Etc.
- Substantial agency effort required.

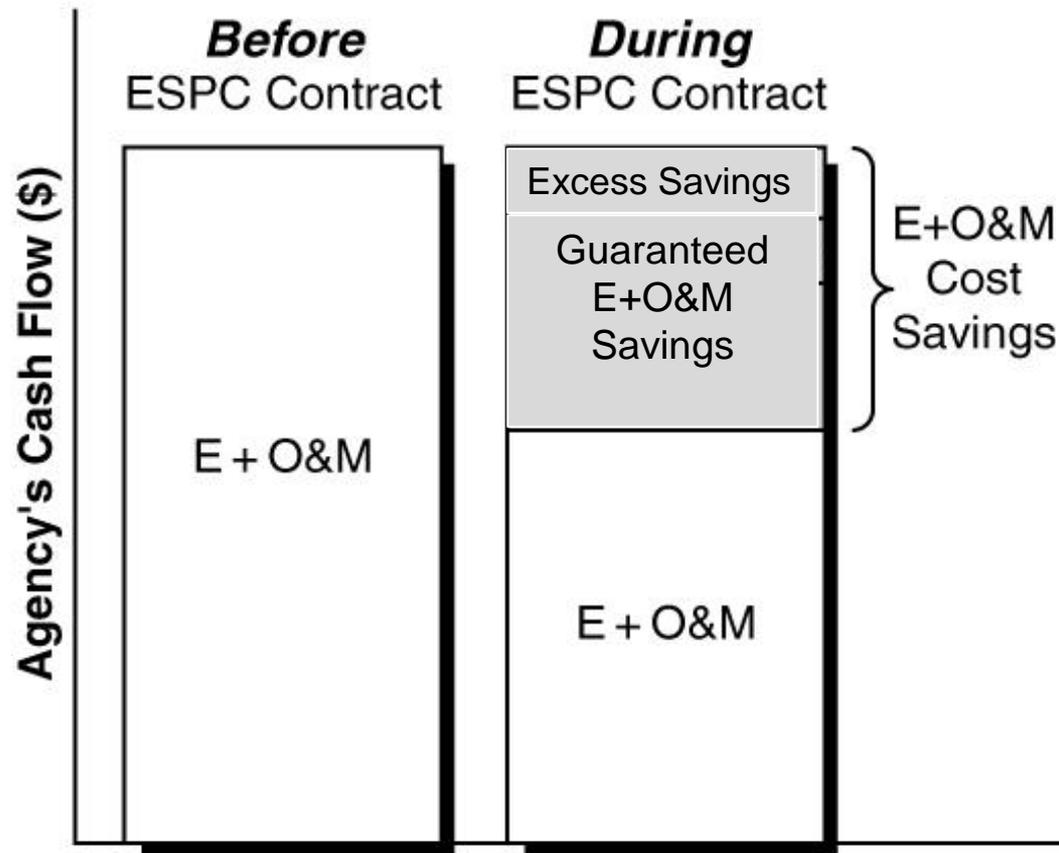


Streamlined

- Less time and effort
- Award Task Orders
- Contract template
- Contractor-initiated & Government-initiated options

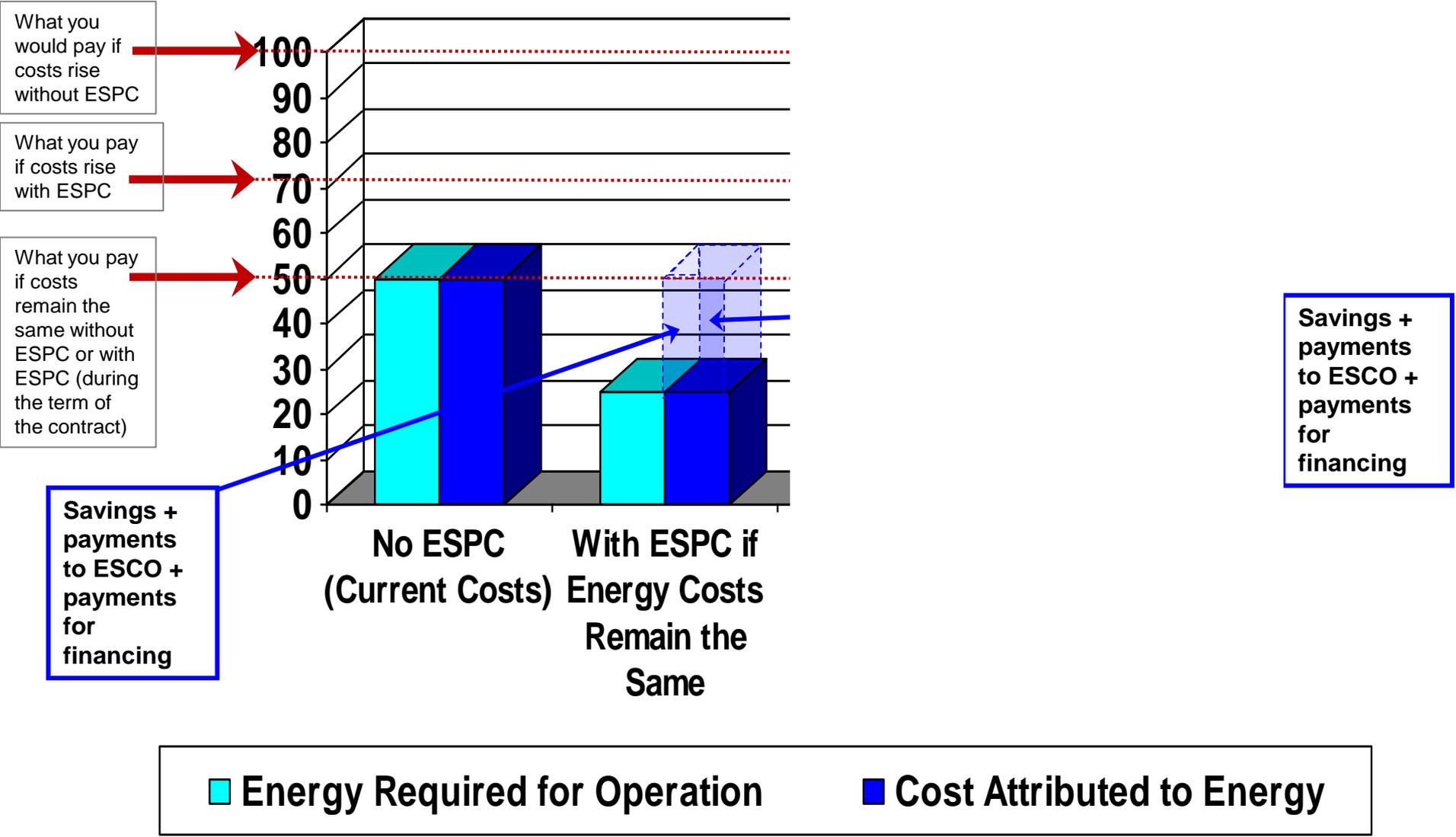
ESPC Basics: Project Cash Flow

Common Question: Where's my savings?!!

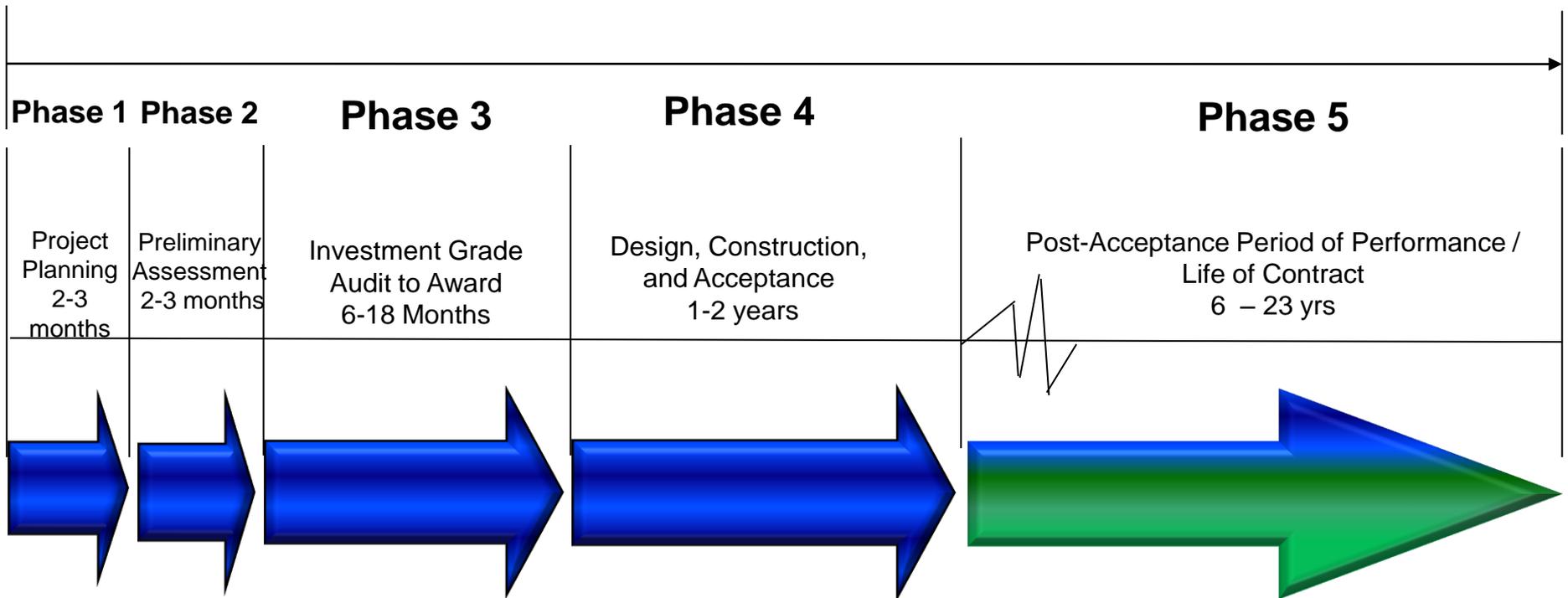


ESPC Basics: Project Cash Flow (cont.)

Common Question: What if energy prices increase?



ESPC Basics: Typical Project Timeline



* Credit for slide concept/ design to Harold Merschman

ESPC Basics: The Acquisition Team

Should represent those affected by project, or who could have impact on progress

- Contracting Officer & Site Technical Representative
- Facility manager, facility maintenance
- Energy, design, and construction engineers
- Procurement and legal staff
- Budget/comptroller
- Administrative services
- Security
- Agency customers and tenants/ Directors & Officers
- Environment, health, safety
- Information Technology
- Anyone else that could stop your process!

ESPC Basics: Acquisition Team Roles

Steer agency's efforts

Build support for project in the agency

Identify agency decision makers who have authority to approve the project

Educate other staff about the project

Ensure that decision makers have all the information they need

Obtain necessary management approvals



Effort Required:

To Award:

~2/3 Energy Manager, 2-5 FTE mos.

~1/3 Contracting, 1-3 FTE mos.

Construction, Cx, and Post-Installation M&V:

Mostly EM, varies widely with project complexity and/or site requirements

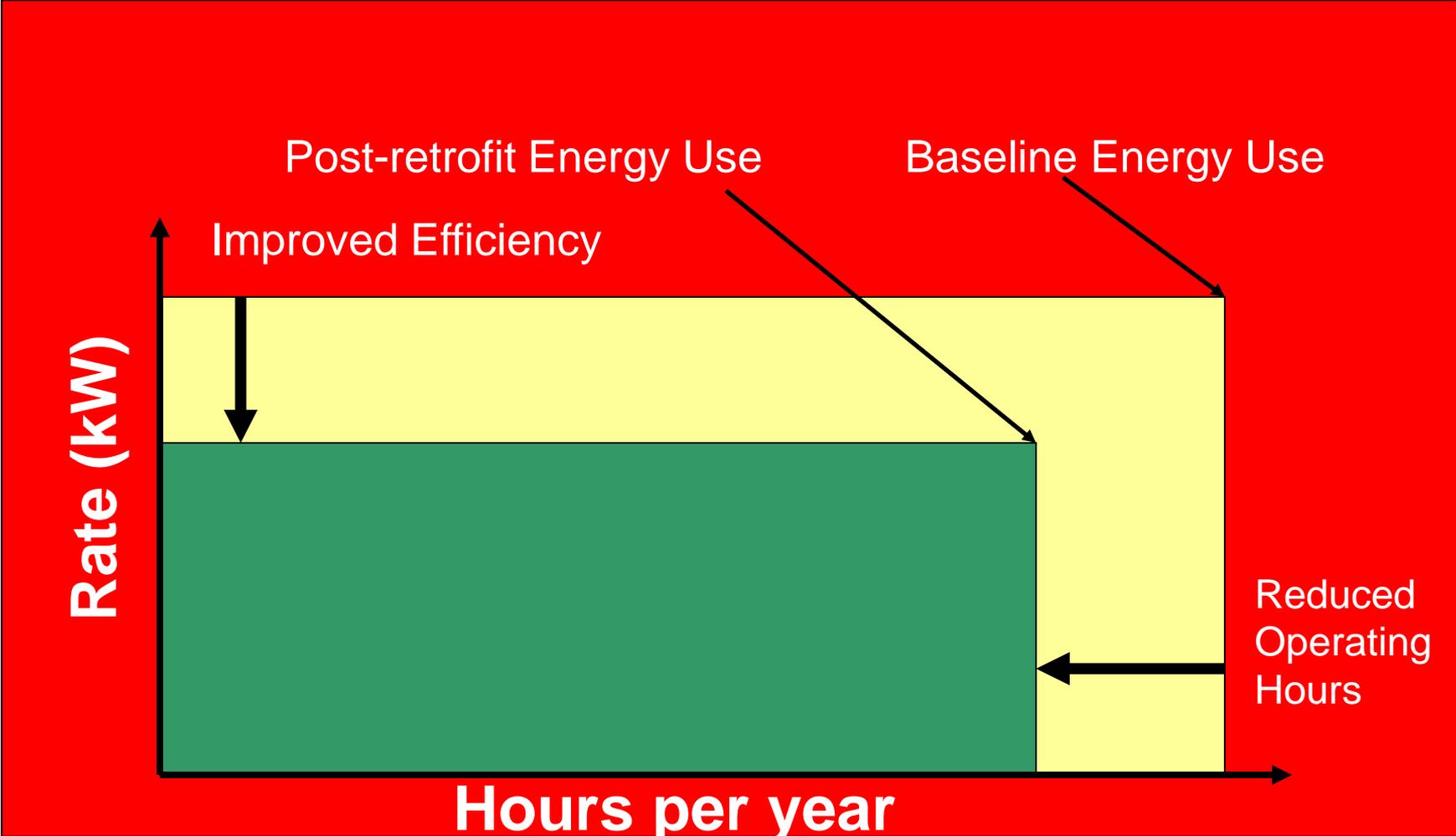
Administer contract through resolution of first-year M&V:

~1 FTE mos.

ESPC Basics: How is the guarantee met?

- Savings that may be used to pay the ESCO are categorized as:
 - Energy and water cost savings
 - Energy- (and water-) related cost savings
- There are two components to energy use and energy savings:
 1. Performance (rate of energy use)
 2. Usage (hours of use)
- Energy use is the product of the two
Example: kW (rate) × hours = kWh (total energy)
- Reducing the rate of energy use and/or the number of hours reduces the total energy use

ESPC Basics: Performance and Usage: Ideal



Source: FEMP ESPC Training Program

ESPC Basics: Savings Uncertainty

We can't measure savings directly

- Because it's the absence of something – i.e., it's energy use that's not there any more

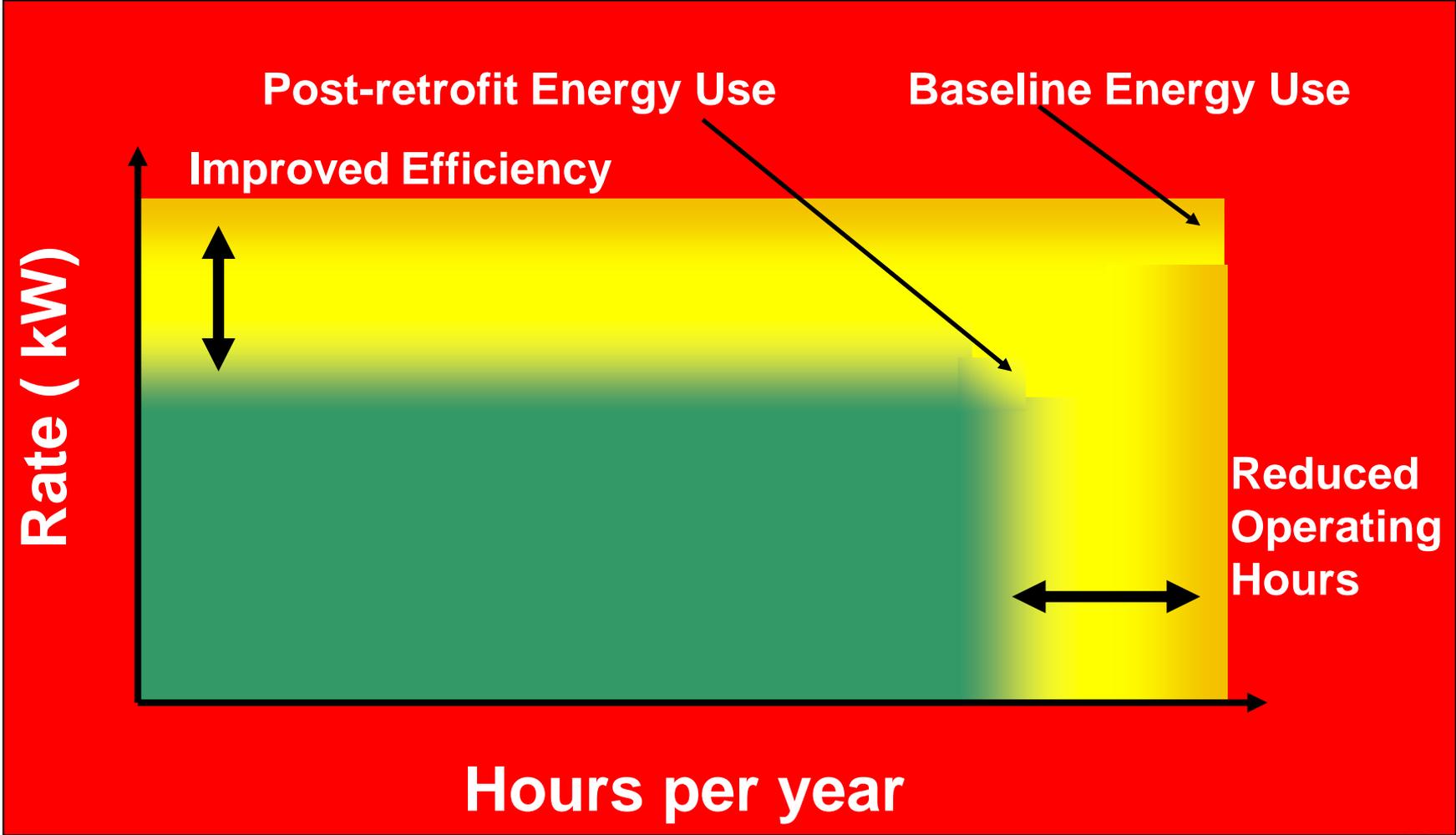
We measure energy use before and after — the savings are the difference

We usually don't know the exact energy use before and after

- there is almost always some uncertainty in each

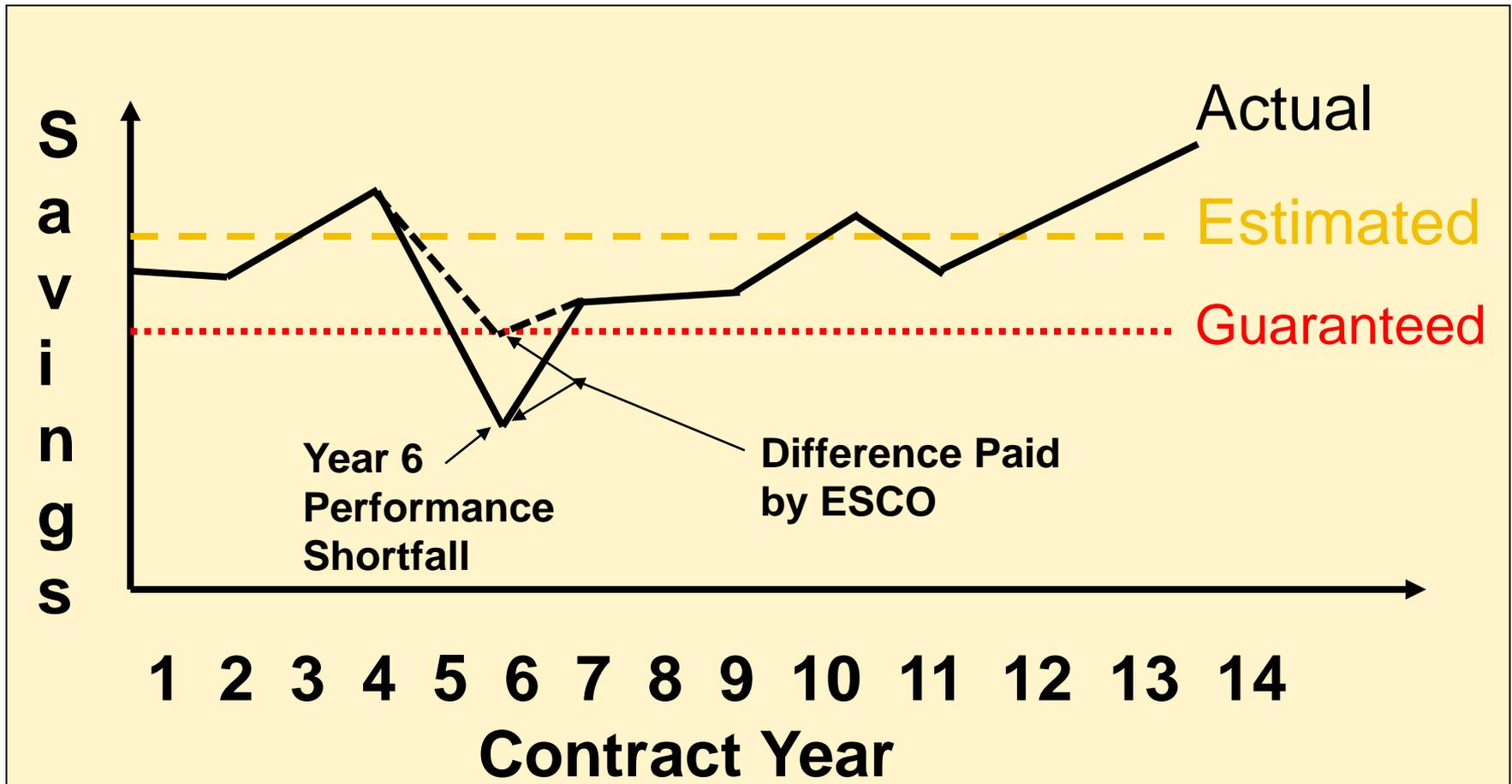
And even when we do, we can't know for sure what's responsible for all the change

ESPC Basics: Performance and Usage: Real



ESPC Basics: Performance and Usage: Real (cont.)

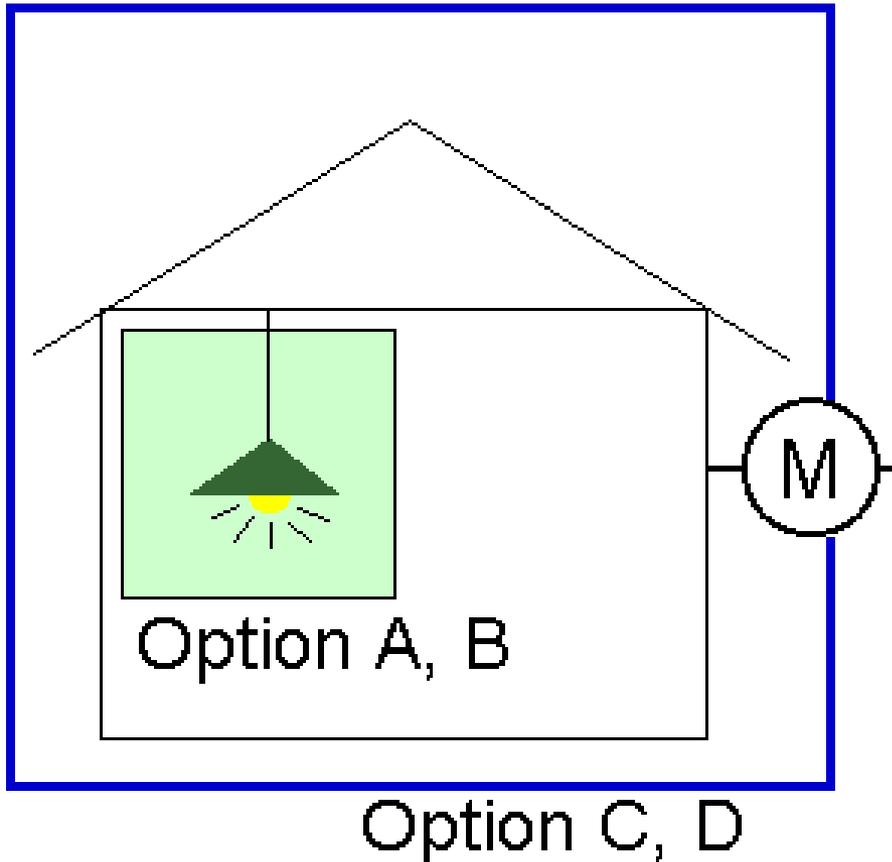
Actual saving will fluctuate, but should always exceed guaranteed amount



ESPC Basics: Measurement & Verification Options

| M&V Option | How savings are calculated |
|---|--|
| Option A: “Retrofit Isolation, Key Parameter” – Based on <i>measured</i> equipment performance, measured or <i>estimated</i> operational factors, and annual verification of “ <i>potential to perform.</i> ” | Engineering calculations using measured and estimated data |
| Option B: “Retrofit Isolation, All Parameters” – Based on <i>measurements</i> (usually <i>periodic</i> or <i>continuous</i>) taken of all relevant parameters. | Engineering calculations using measured data |
| Option C: Based on <i>whole-building</i> or facility-level utility meter data adjusted for weather and/or other factors. | Analysis of utility meter data |
| Option D: Based on <i>computer simulation</i> of building or process; simulation is calibrated with measured data. | Comparing different models |

ESPC Basics: Options A and B vs. Options C and D



Options A&B are retrofit-isolation methods.

Options C&D are whole-facility methods.

The difference is where the boundary lines are drawn.

ESPC Basics: Risk, Responsibility, & Performance



Operational Risk

- Operating hours
- Loads
- Weather
- User participation

Financial Risk

- Interest rates
- Construction costs
- M&V costs/confidence
- One-time savings (energy-related)
- Delays
- Major changes in facility

Performance Risk

- Equipment performance
- Operations & maintenance (O&M)
- Repair & replacement (R&R)

ESPC Basics: Repair & Replacement

R&R for generation ECMs
best done by the ESCO

- Usually unfamiliar to agency, and a failure does not result in loss of mission performance
- If ESCO is doing R&R, they should also ensure O&M is completed



A Brief History of ESPC in the U.S.

1970s: Energy Crisis

- Shared savings contracts are tested to combat rising costs in energy

1970s - 1980s: Initial ESCO Industry Growth

- First ESCOs formulate and develop guaranteed savings business model
- 1985: Federal Government authorizes ESPCs in the Nat'l Energy Conservation Policy Act

1990s: Period of Deregulation & Improved Technology

- Rising energy costs, new technology, and deregulation allow for rapid industry growth
- Consolidated energy companies and utilities are major players
- First federal projects are awarded

Early 2000s: Period of Consolidation, Exit of Utilities

- 2001: Enron collapses
- Re-regulation of markets drive many to leave the industry

2005 – 2010: National Refocusing on Energy and Climate

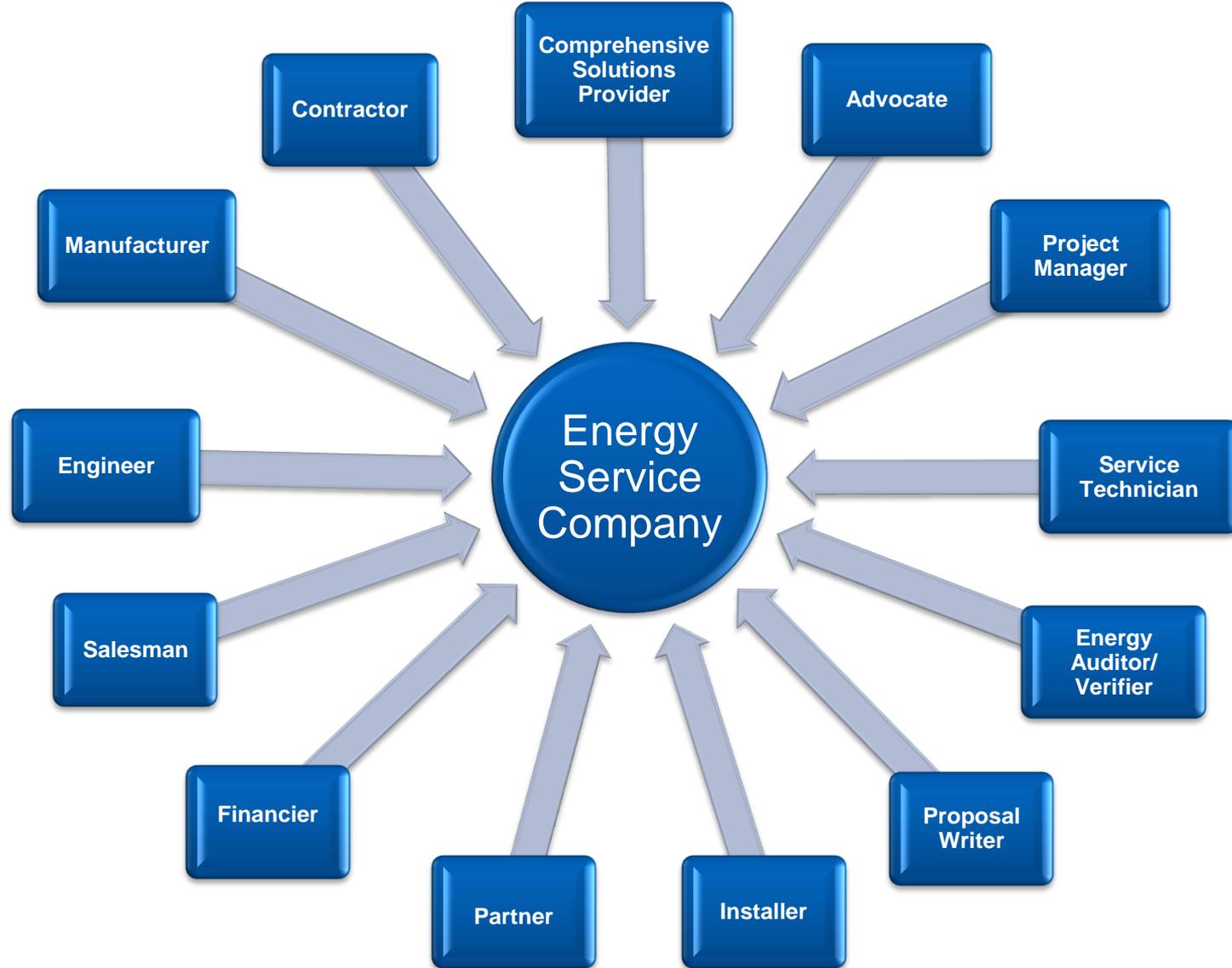
- The *Energy Policy Act of 2005*, the *Energy Independence and Security Act of 2007*, and numerous Executive Orders set new energy reduction and renewable energy goals for federal agencies and encourage the use of ESPC
- According to FEMP, over 257 federal projects with \$5.6B in guaranteed savings were awarded as of 1998 to March, 2010

Sources: FEMP (http://www1.eere.energy.gov/femp/pdfs/do_awardedcontracts.pdf) and Wikipedia (<http://en.wikipedia.org/wiki/ESCO>)

Legislative & Regulatory History of ESPC

- The ESPC authority was first enacted in the National Energy Conservation Policy Act (NECPA), by means of amendment by the Consolidated Omnibus Budget Reconciliation Act of 1985 (P.L. 99-272).
- National Energy Conservation Policy Act (42 USC 8287), Title VIII Shared Energy Savings (1986)
- The Energy Policy Act of 1992 (EPAct) further amended NECPA to authorize federal agencies to execute guaranteed-savings contracts, or ESPCs, with private-sector ESCOs.
- The final ESPC rule is found in 10 CFR Part 436 Subpart B.
- E.O. 13123
- DoD Authorization Act FY05, Public Law 108-375 (2004)
- Energy Policy Act of 2005 (EPAct 05)
- E.O. 13423
- Energy Independence and Security Act of 2007 (H.R. 6 ENR)
- Current Goals required for all Federal Agencies set by EPAct 2005 and EO 13423
- E.O. 13514

ESCO Business Models & Approaches

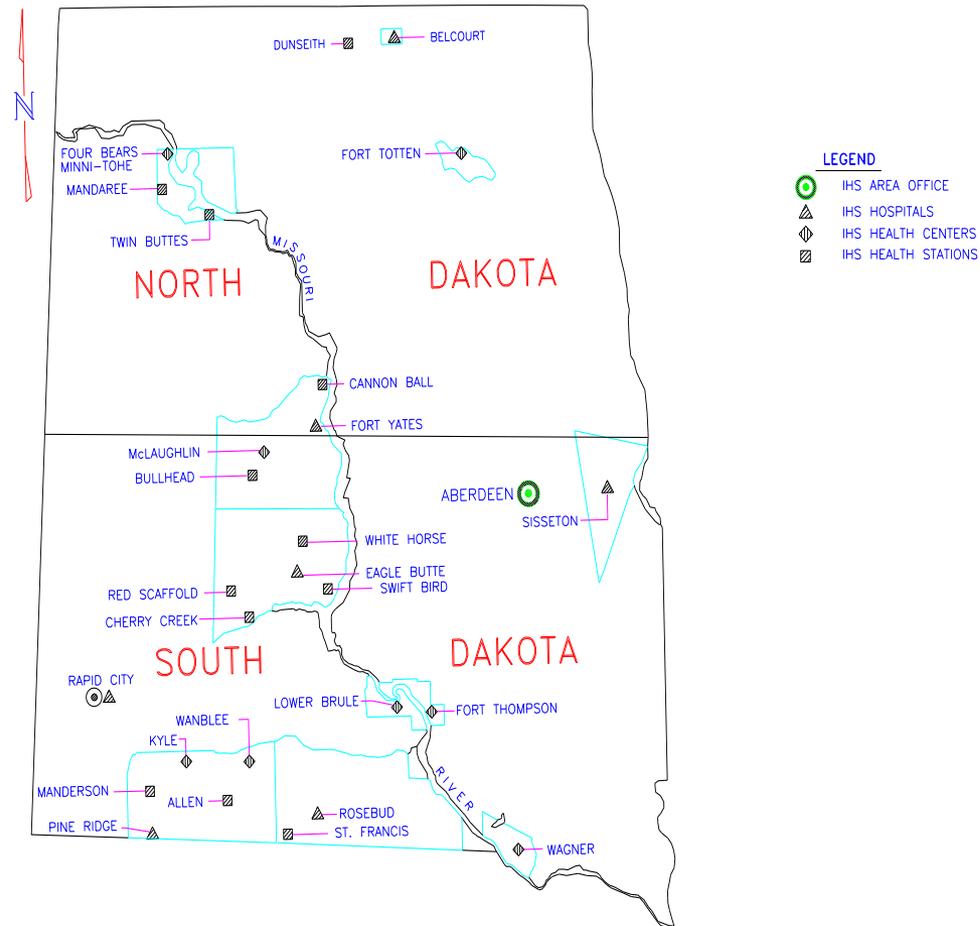


Agency Approaches to ESPCs

- Rule of Thumb: Stand-alone projects of \$2M (+)
- Agency Level Approach – DOI and HHS
 - Possibility of agreement between agencies to provide support for ESPCs between agencies in similar geographic areas
 - Combining sites increases investment level and attractiveness of projects to industry & financiers
- Director Level Approach – BIA and IHS
 - Bundle multiple sites into one contract where projects would not otherwise be feasible or reach required investment levels as stand-alone projects
 - Example: 5 BIA facilities of differing square footage and energy use - how do you divide/ how do you pay?

Challenges in Indian Country

Geographically dispersed sites, low individual savings potential, and different hospital directors (e.g., IHS Aberdeen Area, ND & SD)



Challenges in Indian Country

- Approaches
 - Requires bundling – ECMs and facilities
 - Typically ~\$2M minimum investment needed
 - Admin / transaction costs increase with remote facilities
 - Depending on location (min estimates range from \$1M - \$5M)
 - Numerous hospital Directors with varying opinions of ESPC
 - Various levels of facility expertise, maintenance practices
 - M&V is mostly Option A due to cost
 - Presents some drawbacks and challenges
- Example: Aberdeen Area IHS
 - 9 Hospitals – shared savings across facilities
 - \$2.07M investment, \$344k annual savings (\$216k energy, \$128k O&M)
 - Lighting, controls, some HVAC
 - 15 year contract term includes O&M services



Project Examples

BIA: Sherman Indian High School

500k square feet, >\$450k annual energy costs

Goals:

- *Address maintenance backlog*
- *Improve comfort*
- *Reduce utility costs*

ECMs

- *Lighting retrofits (T-12 to T-8), LED exit signs, occupancy sensors, and exterior lighting*
- *6.9-kilowatt PV system*
- *HVAC modifications in administrative and classroom buildings and one dormitory*
 - *Rooftop unit upgrades, VAV, economizers, boiler and HW replacements*
- *Time clock controls for the weight room, HVAC, and water well pump to reduce operating hours*
- *Pool cover and ventilation controls to reduce heat loss*
- *Pool pump control for unoccupied periods*



6.9kW PV System at Sherman Indian School.

~ Source EE/RE FEMP

http://www1.eere.energy.gov/femp/financing/superespcs_indianaff.html

Almost 40% energy savings, and over \$30k annual O&M savings

Project Examples (cont.)

BIA ESPC: \$12.1M investment, \$29.5M total savings

Chemawa Indian School, Salem, Oregon

Sherman Indian School, Riverside, California

Southwest Indian Polytechnic, Albuquerque, New Mexico

*Haskell Indian Nations University, Lawrence, Kansas

*Riverside Indian School, Anadarko, Oklahoma

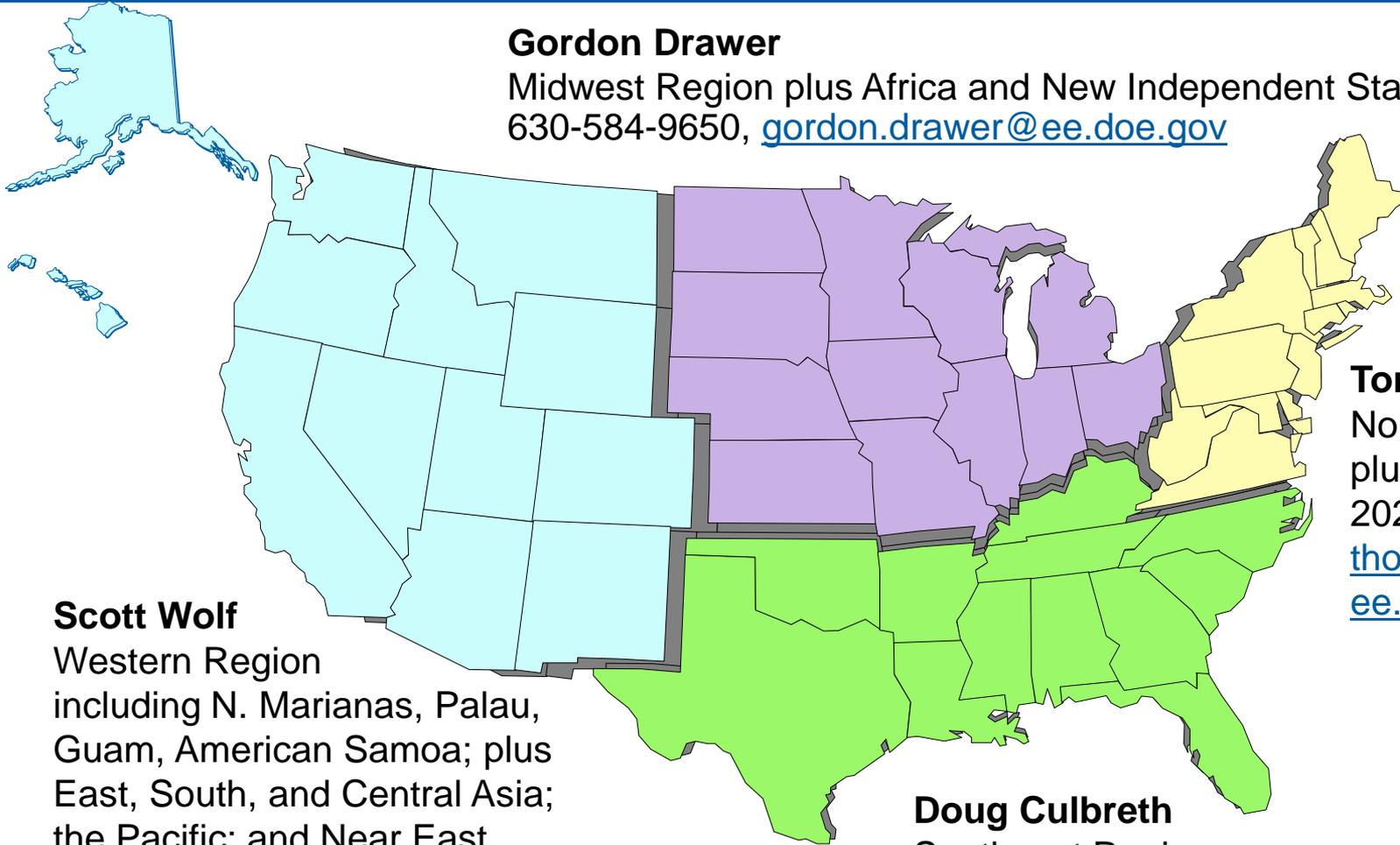
*bundled sites

IHS ESPC: \$2.1M investment, \$6.3M total savings

Aberdeen Area IHS, North Dakota / South Dakota



How to Get Started: DOE/ FEMP FFS



Gordon Drawer

Midwest Region plus Africa and New Independent States
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Scott Wolf

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Tom Hattery

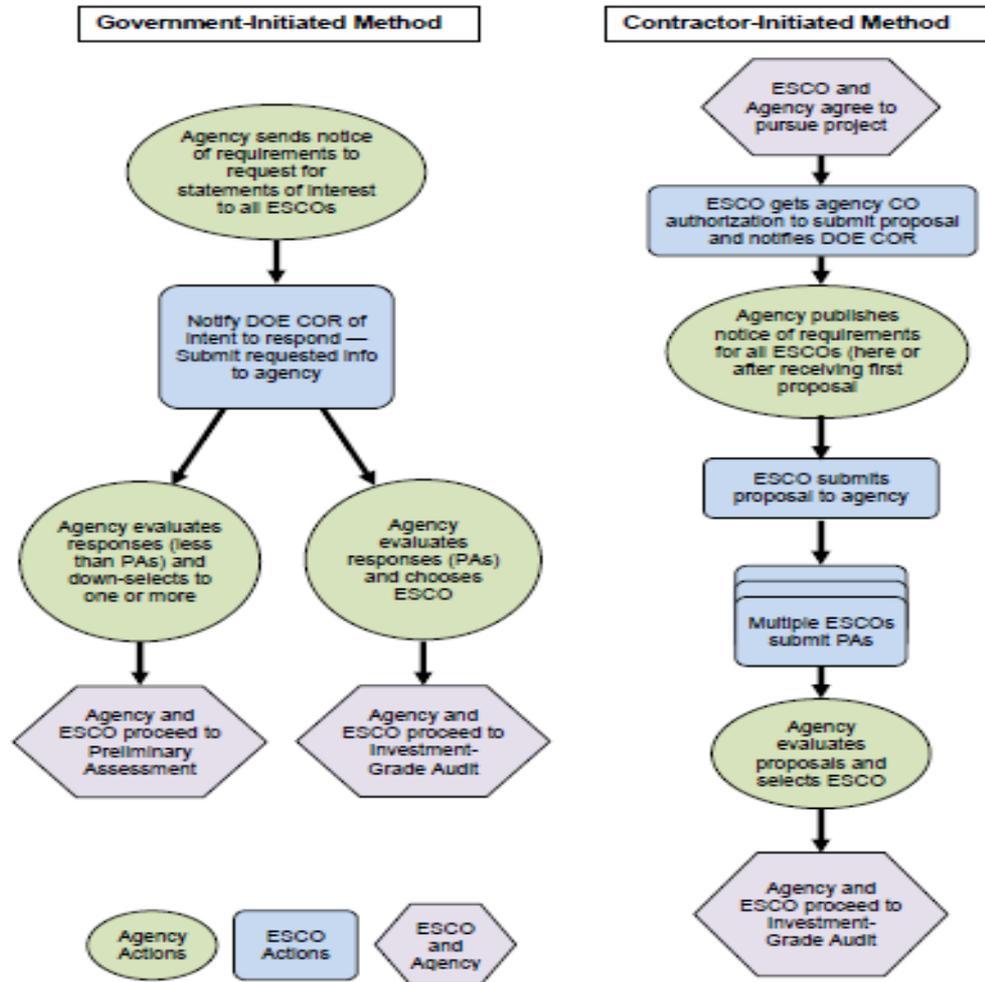
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Getting Started: Two Paths Under DOE IDIQ

ESCO Selection Process (r4 4/8/09)



Review

Hopefully, now you can...

- Define “ESCO” and “ESPC”
- Explain ESPC “savings” as they occur before, during, and after the contract
- Determine appropriate M&V methods
- Explain how ESPCs originated and point to authorizing legislation
- Explore challenges to ESPC in tribal country
- Refer to past project examples
- and... begin with confidence when you’re ready to pursue an ESPC.

Upcoming Tribal Energy Program Workshop

- **Gain confidence and get started**
 - Comprehensive ESPC training
 - Discuss agency issues
 - Meet the contractors
- **Tribal Energy, Business, and Project Development, and ESCO Workshop**

July 13-15, 2010

Denver, CO



Questions?

Thank You!