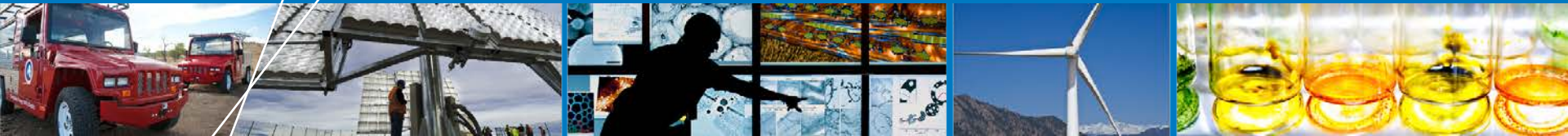


ESPC Intro & ESPC/PPAs for RE



DHS Renewable Energy Roundtable

Doug Dahle

March 26, 2012

NREL/PR-7A40-54592

Overview

- **Energy Savings Performance Contracting (ESPC) Principles**
 - Understanding the money trail
- **Energy Service Companies (ESCOs)**
- **Risk Management**
- **Tools for ESPC Customers**
- **Consider Master ESPCs**
- **Business Principles**
- **ESPC/Power Purchase Agreements (PPAs) for Renewables**

Energy Savings Performance Contracts (ESPCs)

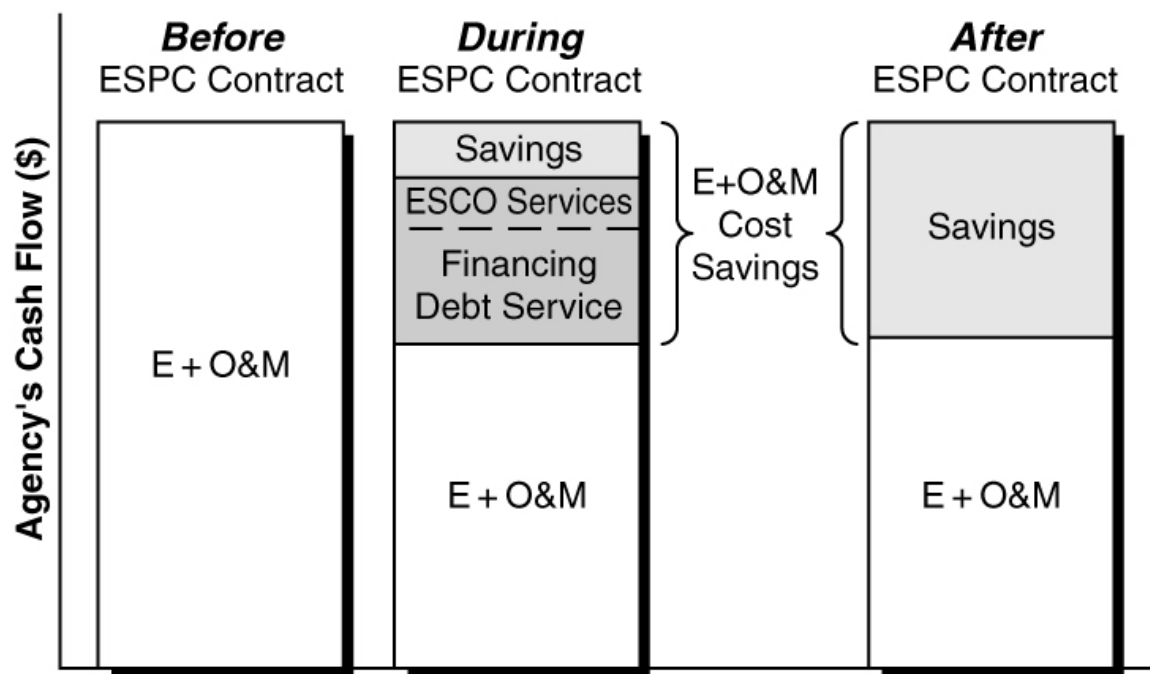
- Long-Term Partnerships (15-25 years)
- **Persistent** Performance is Success Factor
- Customer Champions & Commitment **Critical**
- “Reallocating Excess Energy Expense into Infrastructure”*
- No Capital Cost – Contractor Revenues from \$ Savings*
- Determine Energy and \$ Savings*
- Risks & Responsibility – Key focus for both parties
- Measurement & Verification – Verify Savings

* Figures in following slides

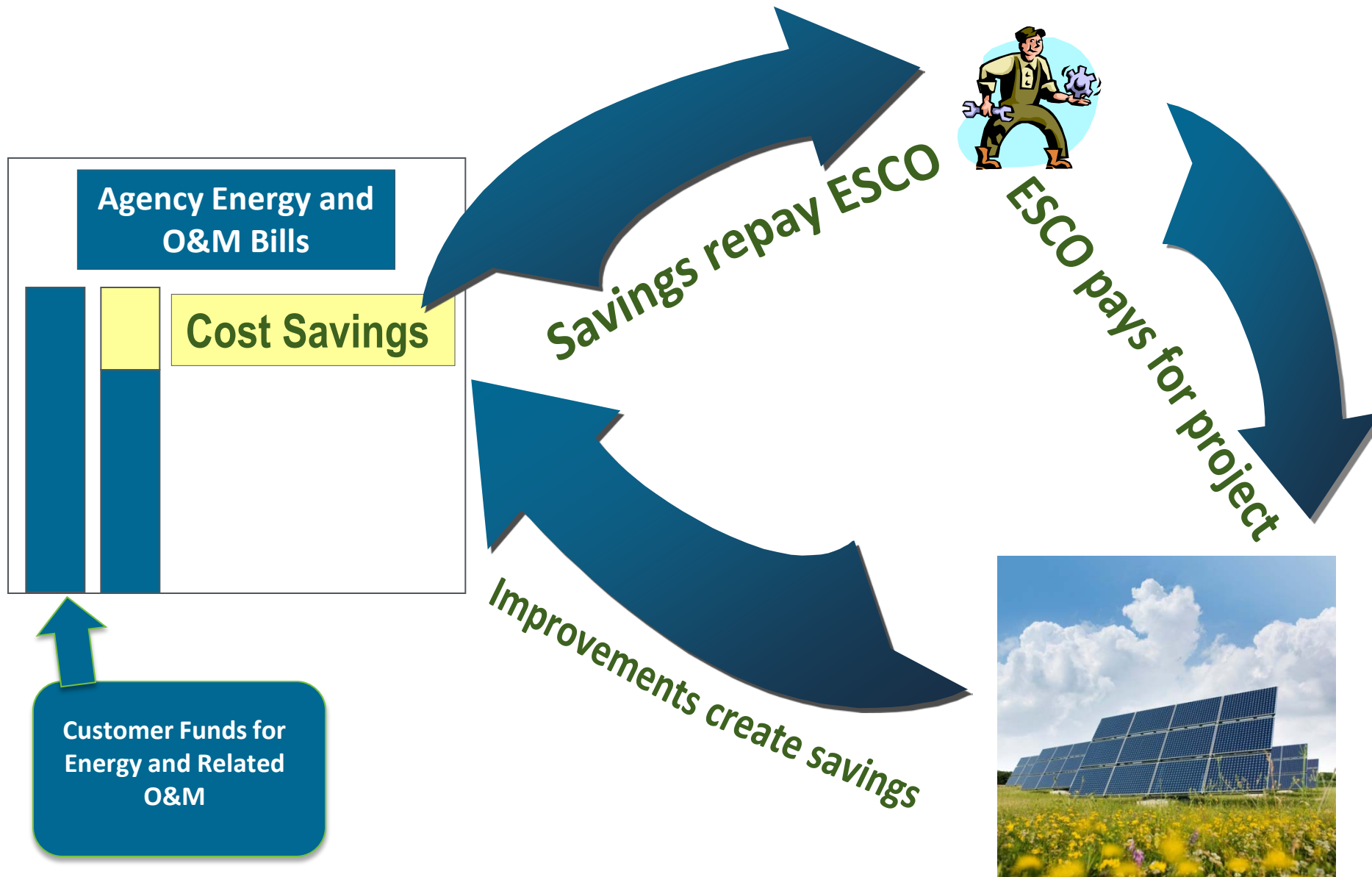
ESPC Principles

- **Reallocating Excess Energy Expense into Infrastructure**

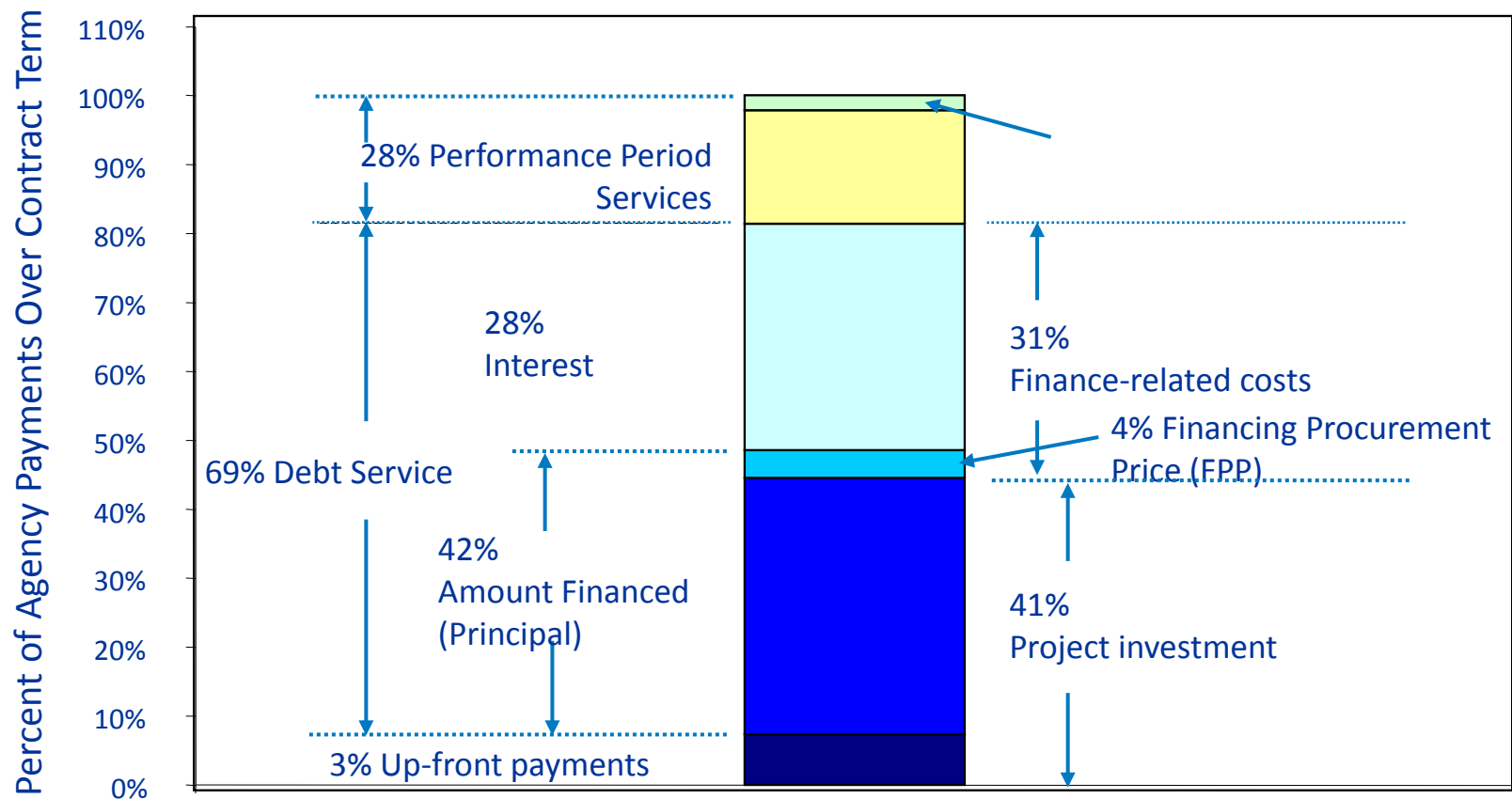
- Pay a lower utility bill
- Pay the contractor
- Achieve cost savings for the government



Where the Money Comes From and Where it Goes



The Project Cost Stack



*Data from Super ESPC projects awarded from 2005 to May 2008.
Figures may not add to exactly 100% due to rounding.

Energy Services Companies (ESCOs)

- **A long term energy management partner**
- **Customer focused service & communications**
- **Listen to understand customer needs**
- **Offer solutions to best address customer needs**
- **Propose and document potential ESPC project**
- **Good faith negotiations to meet mutual needs**
- **Motivated – Financial return from long term revenues**

Energy Services Companies

- **Expertise in Energy Efficiency & Supply Solutions**
- **ESCO delivers in ESPC**
 - Audits and Baseline Energy Status & Data
 - Design & Installation of Energy Measures
 - **Arrange Financing**
 - Commissioning & Post-Installation measurement
 - Customer training on installed measures
 - Operations & Maintenance (O&M)
 - **Responsibility for O&M negotiable**
 - Continuous verification of savings

Energy Conservation Measures

- Lighting
- Heating, Ventilation, and Air Conditioning (HVAC)/Variable Air Volume (VAV)
- Energy Management Control Systems
- High Efficiency Motors
- Variable Frequency Drives
- Boilers/Chillers
- Renewables
- All Other Energy Consumption Sources
- **Customer input:**
 - Energy/water use & cost, energy related O&M costs
 - Energy goals & wish list of projects

Facility Requirements

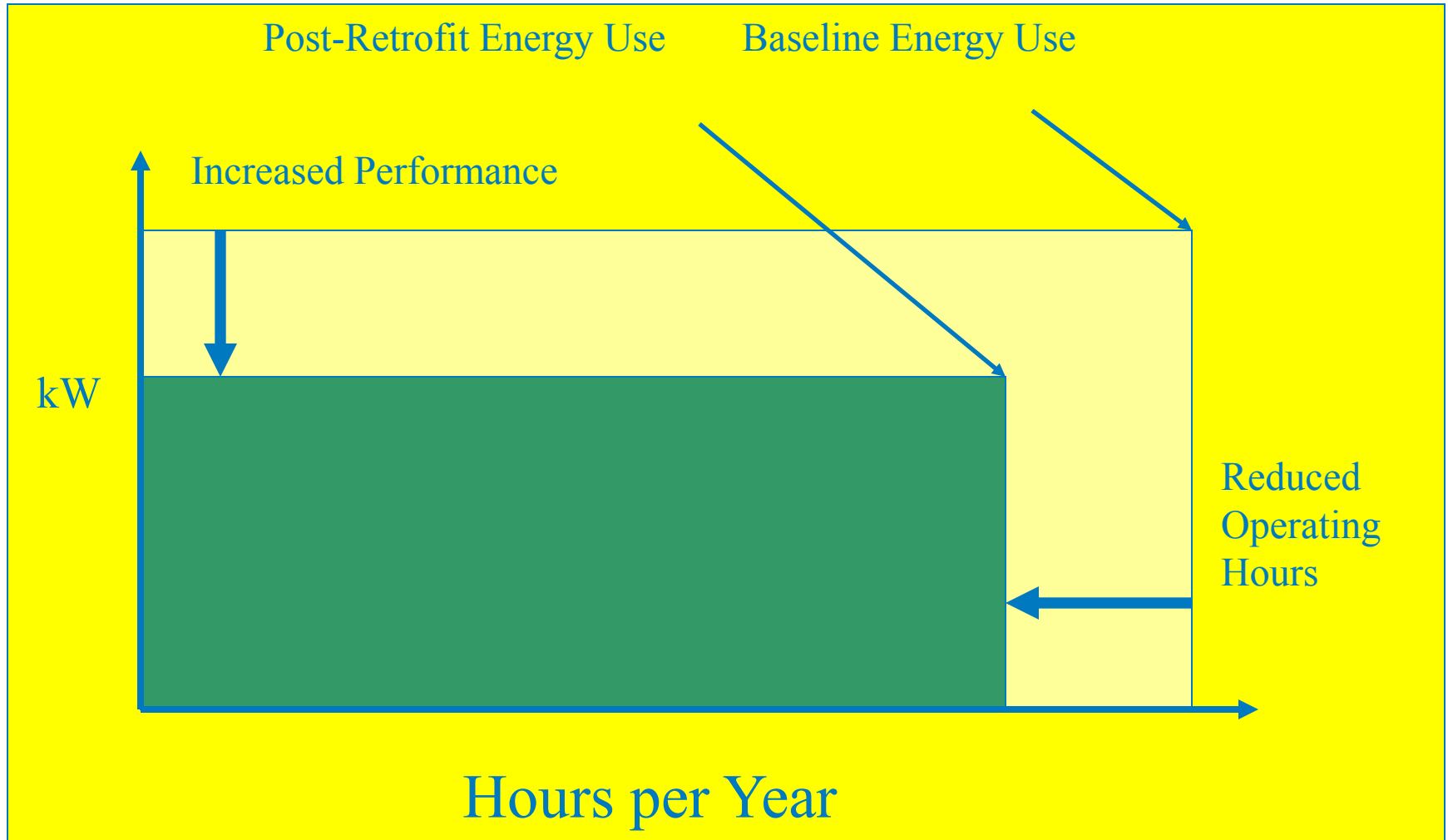
- **Customer sets standards for building operations**
 - Lighting levels, indoor comfort (HVAC)
 - Energy system controls
 - Shut down HVAC during unoccupied hours
- **Commissioning**
 - Customer/ESCO develop design intent
 - ESCO prepares Commissioning Plan after project design
 - Tests to ensure facility requirements are met
 - Commissioning equipment tests & report

Energy/Water Savings

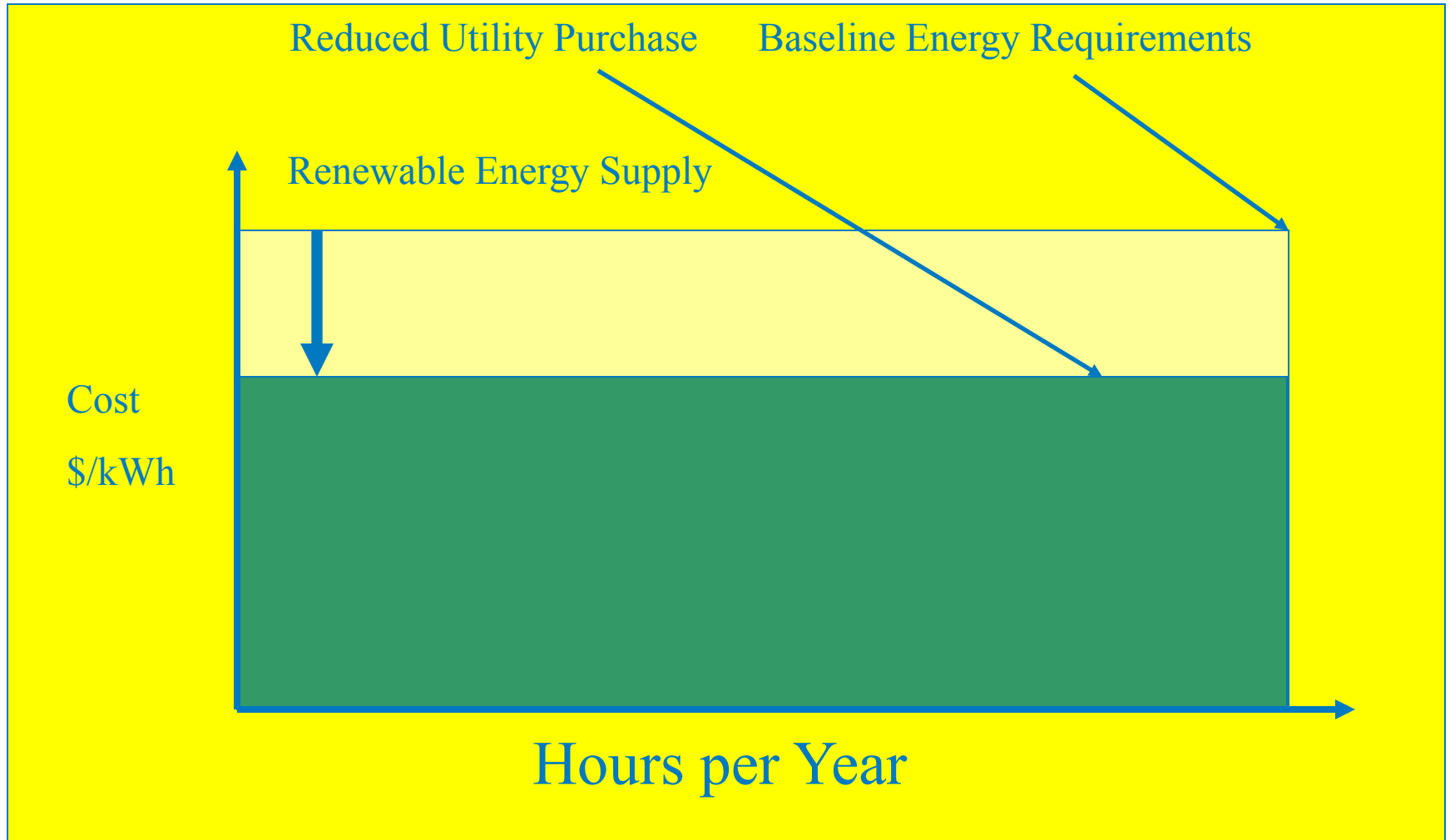
Measurement & Verification (M&V) Goal – Verify Annual Energy & \$ Savings

- **M&V Plan (set at contract award)**
 - Develop pre-installation energy baseline
 - Measure post-installation performance
 - How energy savings is calculated:
 - (pre-installation baseline) – (post-installation performance)
 - \$ Savings = Energy Savings x Energy Rates
- **Post Installation M&V Report**
 - Demonstrates potential guaranteed savings/year
- **Periodic M&V Report (typically annual)**
 - Verifies annual guaranteed saving achieved

Determine Energy & \$ Savings: Energy Efficiency



Determine Energy & \$ Savings: Renewables



Risk Management

- **Goal: Persistent savings over long term**
- **Example: Building owner assumes O&M**
- **Risk:**
 - Resources for building owner O&M to deliver savings
 - If performance degrades, ESCO expects full payment
- **Benefit:**
 - Building owner to consider and manage project risks
 - Increased infrastructure investment
- **Risk & Responsibility Matrix (assess range of risks):**
 - http://www1.eere.energy.gov/femp/financing/espc_resources.html
 - See 2.3 (MS Word doc)
- **Financial, operational, performance issues**

Tools for ESPCs

M&V Document Templates:

- **M&V Plan**
- **Post Installation M&V Report**
- **Periodic M&V Report**

Renewable Energy Screening (no cost)

- **Pre-project analysis of cost effective RE opportunities:**
 - Solar (thermal & electric generation)
 - Wind
 - Biomass (biofuels, thermal, waste-to-energy)
 - Combined Heat & Power
 - Geothermal

Master ESPCs

- **Includes common ESPC terms and conditions**
- **Modify scope of work for specific sites**
- **16 ESCOs awarded Master contracts**
- **Designed for federally owned facilities:**
 - Ameresco; Chevron Energy Solutions; Clark Energy Group; Consolidated Energy Solutions; Constellation Energy Projects & Services Group; FPL Energy Services; Honeywell Intl.; Johnson Controls Government Systems; Lockheed Martin Services; McKinstry Essention; NORESKO; Pepco Energy Services; Schneider Electric Systems; Siemens Government Systems; The Benham Companies; Trane

Public/Private Partnerships

- **Agency ESCO selection:**
 - Qualifications/interviews > down select
 - Short list & submit preliminary assessment
- **Conducts at risk, facility survey to identify energy projects:**
 - If not economically viable, no cost to customer
 - If economically viable, develops ESPC project
 - If customer rejects, customer reimburses ESCO costs
 - If customer accepts, ESCO effort part of project cost
- **ESPC project developed and negotiated**
- **Customer acquires infrastructure improvements and facility energy efficiency at no capital cost**

Business Principles

- **ESCO Project Investment Thresholds:**
 - Transaction Costs vs. Rate of Return
 - Markup (15-20%), Profit (6-10%)
 - Common target $\geq$ \$1 Million investment
 - Economy of Scale
 - ESPC Scope Considerations
 1. Bundling energy efficiency (EE) & renewable projects
 2. EE & private owned RE projects
 - A. Capture tax incentives & state incentives
 3. Non-infinite delivery, infinite quantity (IDIQ) ESPC request for proposal (RFP) for RE Only

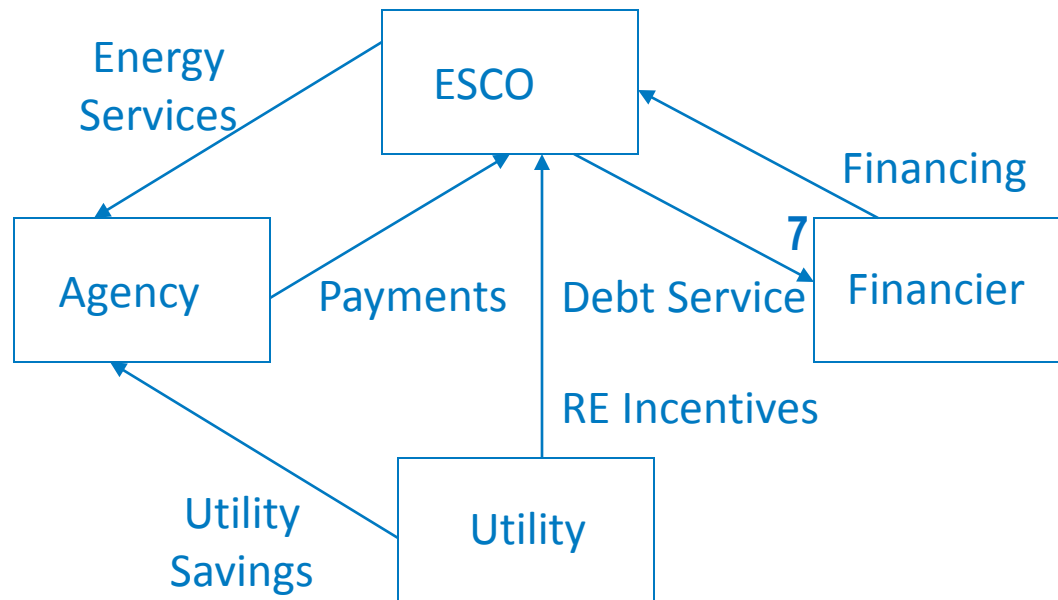
ESPCs/Power Purchase Agreements (PPAs) for Renewable Projects

- **Key:** 25-year contract authority less construction time
- RE Project developers seek minimum 20-year PPA
- Office of Management and Budget (OMB)/Council on Environmental Quality (CEQ) 8/16/11 endorses ESPC/PPAs
- FEMP Support to Agency & ESCO
- Private Ownership & Operation of RE Energy Conservation Measures (ECMs) works
 - IDIQ allows ESCO to grant ECM private ownership (H.2)
 - Private party - Federal Tax Incentives (ITC & MACRS)
 - ESPC/PPA terms & conditions
 - Guaranteed Production Requirements
 - Termination schedule
 - Agency License/Easement – Key to financing

ESPCs/PPAs for Renewable Projects

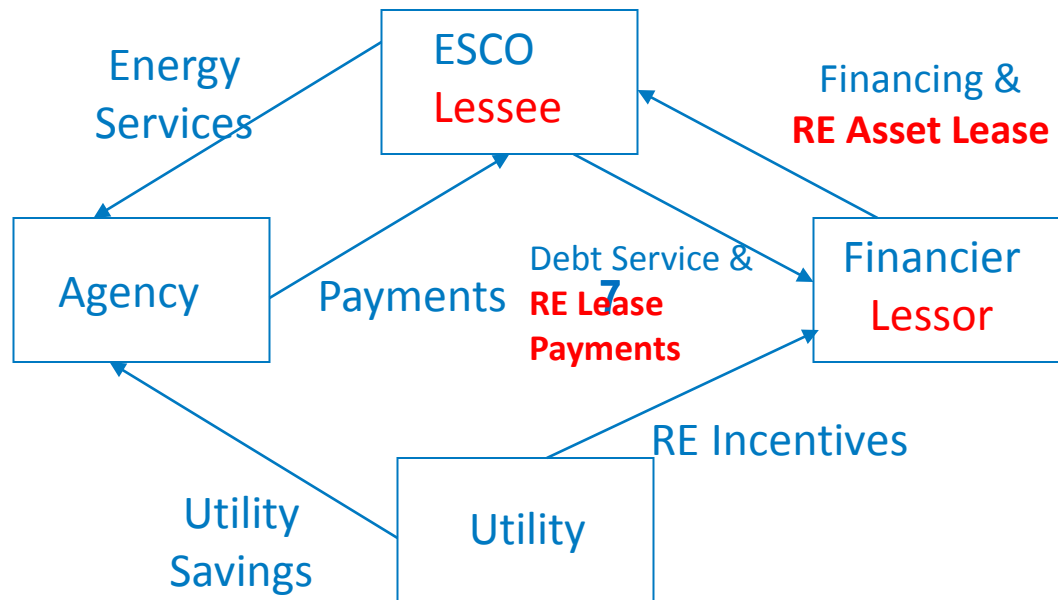
- **ESPC/PPA Terms & Condition (cont'd)**
 - Owner Warranties
 - PV (25 years), Inverters (10 years)
 - RE Asset Title Issues
 - Government Purchase Option
 - Asset Appraised Value required by IRS
 - Recommend not before 7 years (vest tax incentives)
 - Remove at ESPC expiration (wear & tear accepted)
 - Cannot acquire Asset at \$0 cost
 - Consider owner retention > follow on PPA (10 years)

Cash Flow & Parties for Renewable Energy ECMs in ESPC

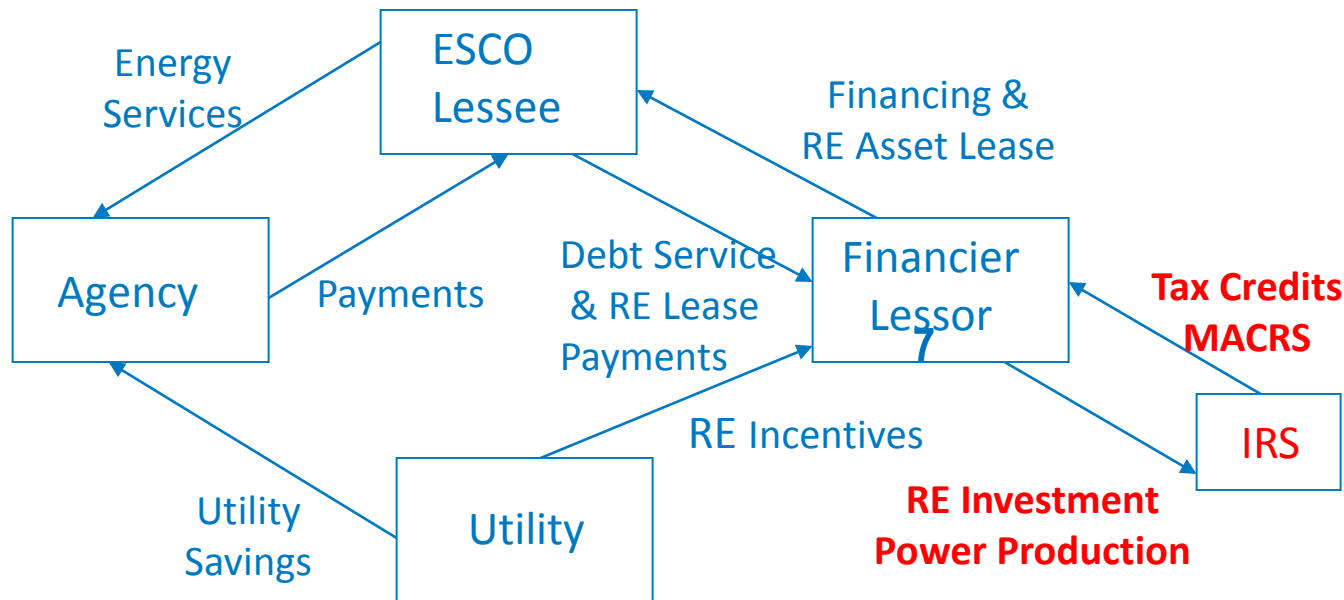


Cash Flow & Parties for Leveraging Tax Incentives for RE in ESPC

Private Sector Lease



Meeting IRS Regulations

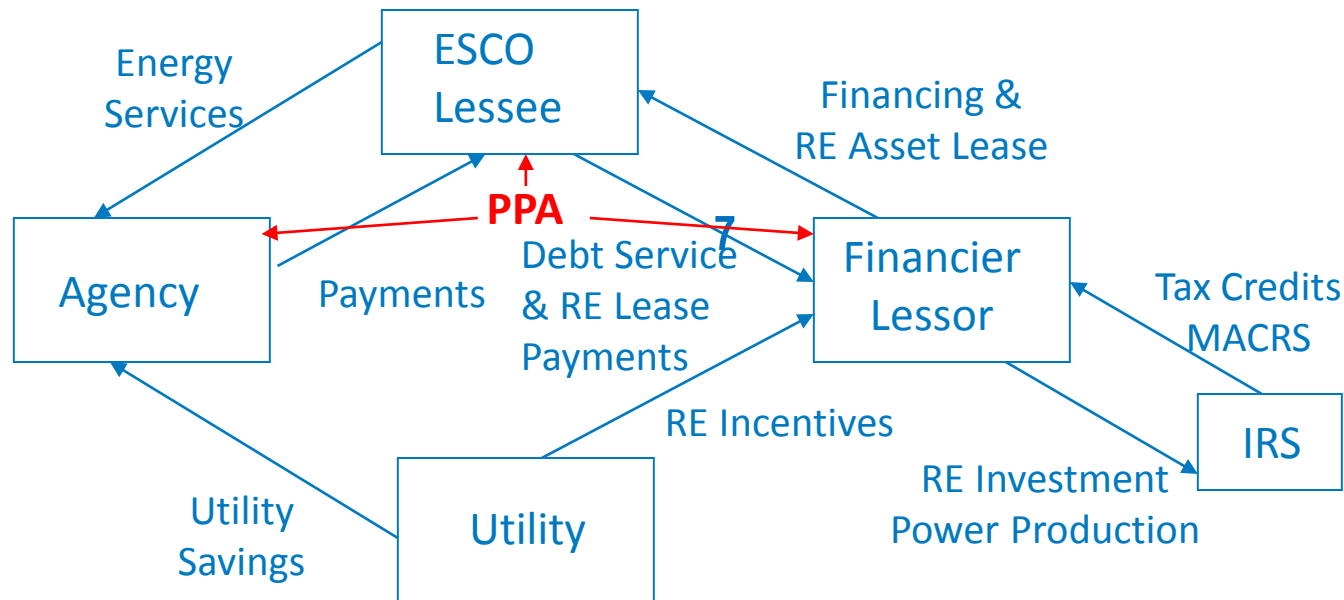


IRS Tax Tests:

- Lease Term < 80% useful life
- At lease end asset value $\geq$ 20% initial value
- Lessee purchase option – protect Lessor ROI
- Lessor must have 3% cash on cash return

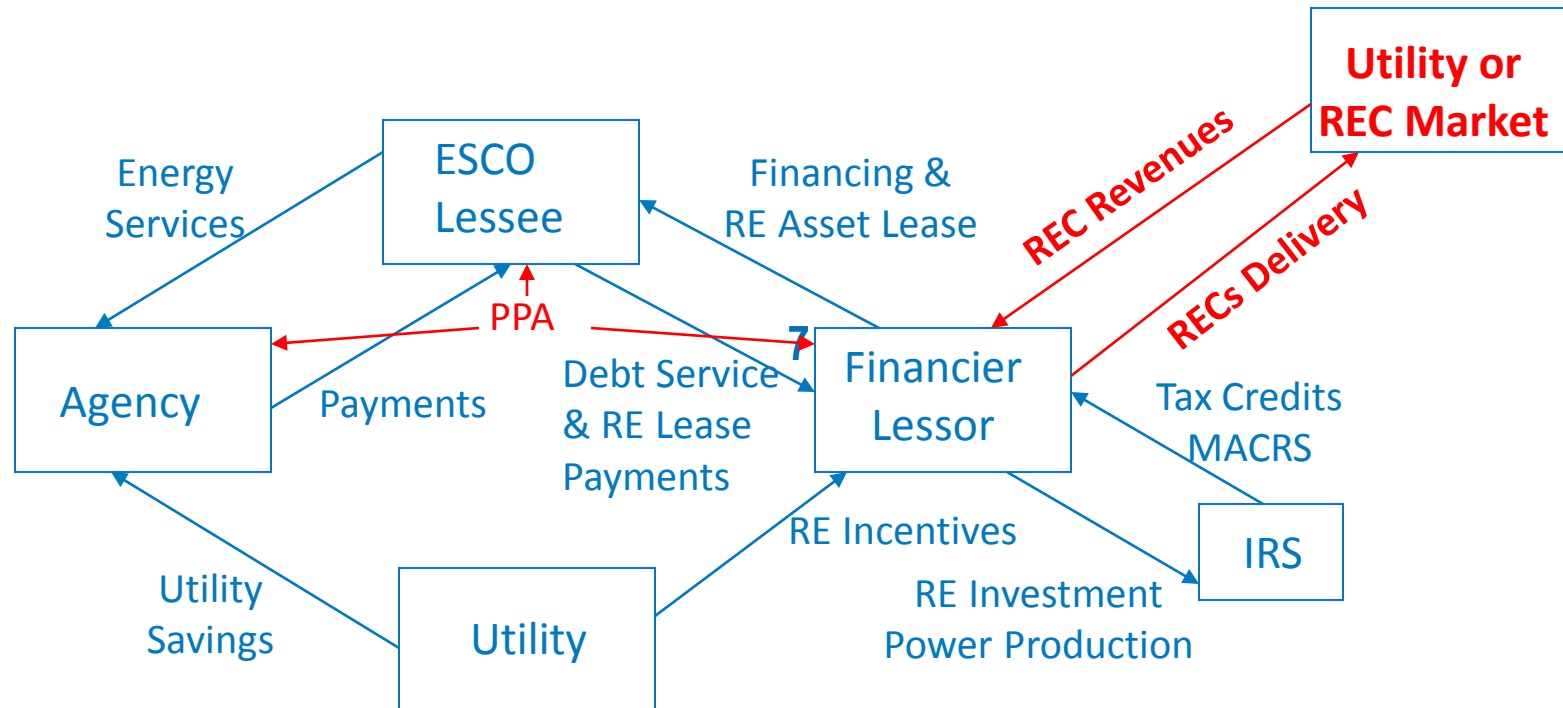
Cash Flow & Parties for Leveraging Tax Incentives for RE in ESPC

PPA – Deliver RE Power at $\leq$ current cost



Cash Flow & Parties for Leveraging Tax Incentives for RE in ESPC

Private Party Owns RECs



Panel Discussion- PPAs within EPSCs

- **How to Replicate DHS Success – Day 2 1:30 pm**
- **USCG – Puerto Rico, Awarded 12/16/10 (3 MW PV)**
- **FLETC – Cheltenham, MD, Awarded 12/29/11 (2MW PV)**
- **Panel**
 - James Richardson – DHS
 - Bill Bresnick – DHS
 - Wilson Reynolds – Energy Management Engineering, Inc.
 - Doug Dahle – NREL