ITP Webinar September 13, 2011

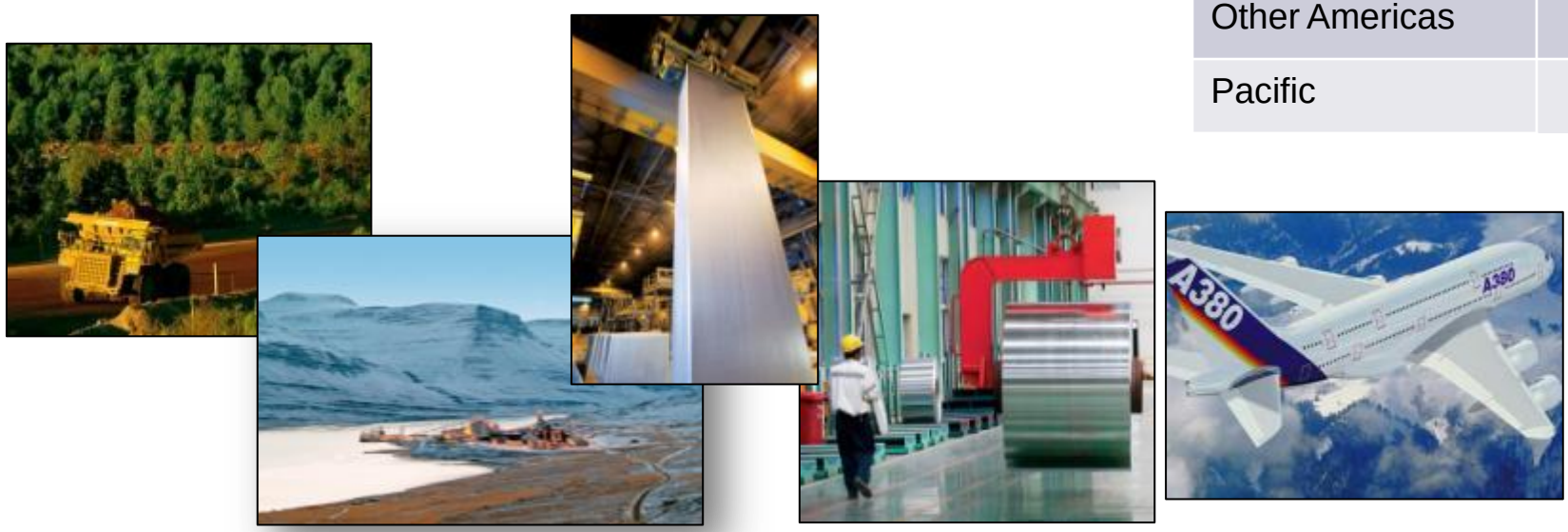
Alcoa can't wait for tomorrow

Securing Financial Incentives for Energy Efficiency Projects: How to Create Corporate Support

Alcoa at a Glance

- Founded in 1888
- 200+ locations
- 31 countries
- $21.0 billion 2010 revenue
- Alcoa's lost workday injury rate is 1/10 that of the average U.S. manufacturing workplace
- Award-winning sustainability leadership
- 120 years of aluminum technical leadership, including the original aluminum process

Number of Employees (2010)	
U.S.	24,000
Europe	17,000
Other Americas	11,000
Pacific	7,000
	59,000



Worldwide Operations – Regional Strength

Aluminum – The Miracle Metal

Drives fuel efficiency

Replacing 2 lbs. of steel with one pound of aluminum in a city bus can **eliminate up to 35 pounds** of greenhouse gas over its lifetime

Makes hottest gadgets cool

Aluminum's **look, feel, durability and thermal conductivity** make it a top trend in consumer electronics

Takes you out of this world

Nearly all the **alloys** used in modern aircraft were **developed by Alcoa**

Infinitely recyclable

More than one **trillion cans have been recycled** in America since Alcoa pioneered the industry in 1972

Builds a strong foundation

An office building using aluminum-enabled building envelopes can **drive 20% energy savings** over similar buildings: and 157 tons of CO_2 per year

Almost 75% of all aluminum produced is still in use today

The Aluminum Leader for 125 Years

- We invented the aluminum smelting process in 1888
- Alcoa is the largest producer of aluminum in the world
- Alcoa is the leader in aluminum technology and innovation
- Only aluminum company covering every stage of aluminum production:

Operations

Upstream

- Bauxite mining
- Alumina refining
- Aluminum smelting
- Aluminum recycling

Midstream

- Flat rolled aluminum

Downstream

- Fastening Systems
- Power & Propulsion
- Wheel & Transportation
- Building & Construction
- Forgings & Extrusions

Innovation is Our Heritage

Year

1886 | 1890 | 1900 | 1920 | 1940-1950 | 1960 | 1980 | 1990 | 2000 | Today

Aluminum Beginnings

Cookware

Airplanes

Electrical Conductor

Household Foil

Truck bodies & Wheels

Model T Castings

Buildings

Marine

Easy Open Cans

Heat Exchangers

Automotive Structures

Audi A8

Ferrari Modena

Space Shuttle

Consumer Electronics

Defense

Airbus A380

Environmentally-Friendly Bus

Oil & Gas

Aluminum Bottles

Alcoa Corporate Support for Energy Efficiency

- Why energy efficiency is important to Alcoa
- Global Energy Organization
- Tools / Procedures Employed
- Management Commitment

Why Improve Energy Efficiency? The reasons are clear

Cost

- Alcoa spent $3.4B on energy – 16% of our 2010 revenue
- In 2011, our businesses are on track to meet the $56M spend reduction team targets.
- Energy costs are continuing to rise

Sustainability

- It is not easy to be “green” as a large energy consumer
- Energy Intensity Reduction is key to improving Alcoa’s sustainability.
- In each of 2009 and 2010, we created ~$100M of annual savings
- ~70% are sustainable

This is not just about this year or next…

…energy efficiency is our future.

Long-term energy targets show us where to go

Strategic Sustainability Targets

- 10% reduction in the energy intensity of primary operations by 2020; 15% by 2030 (from 2005 baseline)
- 20% reduction in the energy intensity of all other businesses by 2020; 30% by 2030 (from 2005 baseline)

Save ENERGY Now ®

U.S. DEPARTMENT OF ENERGY INDUSTRY PARTNERSHIP LEADER

Voluntary reduction in energy intensity of 25% by year 2020 for US non-smelting locations (from a 2005 baseline)

Source: www.alcoa.com/sustainability

Global Energy Group is a resource

Corporate energy group

- **Coordinate amongst businesses and regions**
- **Rapidly replicate opportunities across the company**
- **Facilitate assessments and strategy**
- **Provide consultants**
- **Provide training**
- **Coordinate best practice development**
- **Assist locations with energy plans**
- **Act as a clearing house for information**

Communications
Case Studies aid in rapid replication

No. 1 Case Study
Alcoa Latin America & Caribbean Energy Efficiency Program

No. 2 Case Study - Recognition Awards for Alcoa in Canada

2011 No. 3 Case Study - Metering
Alcoa Cleveland Forged Products Case Study

2011 No. 4 Case Study - Critical Measurement Equipment
Alcoa Jamalco/Warrick/Davenport

Execution
Opportunities are there: Assessments bring them to light

Alumar Assessment July 2010

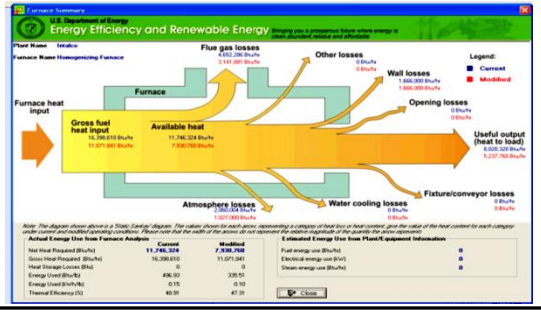
- $5 million identified opportunity
- 1.2 year payback
- $130,000 Immediate opportunity

- Go to the source: operators know where opportunities are
- Planning is critical: bring the right resources together and involve leadership
- Take calculated risks
- Tear down long-standing barriers

Itapissuma Assessment

- $2.4 million identified opportunity
- $1.3 requires no capital

Intalco Process heat assessment



- $ 1.1 million identified
- $ 562, 000 implemented

2010 Assessments Identified over $20 million

* Finished goods inventory

Execution
Webinars allow for participation by many

Alcoa Lighting Webinar
January 20, 2011

Metering
&
Measurement
Webinar
Part 1 of 2

ALCOA

Tom Fenimore, PE, PEM, CEM
Energy and Utilities Consulting Services

March 8, 2011

Webinars are scheduled for the fourth Tuesday of each month at 11:00 a.m. PST/2:00 p.m. EST. Please see the bottom of this invitation for the Webinar schedule. The login and call-in information will be the same for each Webinar:

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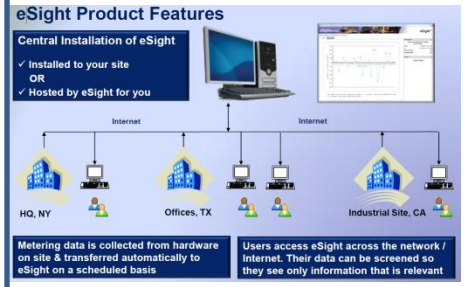


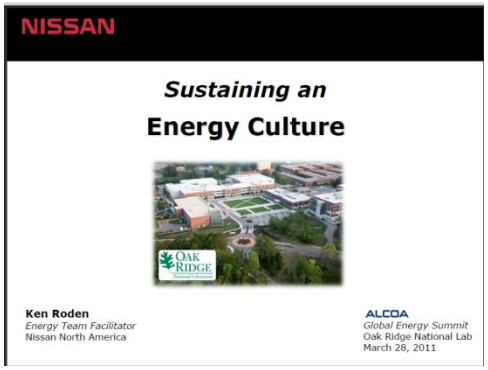
Metering
&
Measurement
Webinar
Part 2

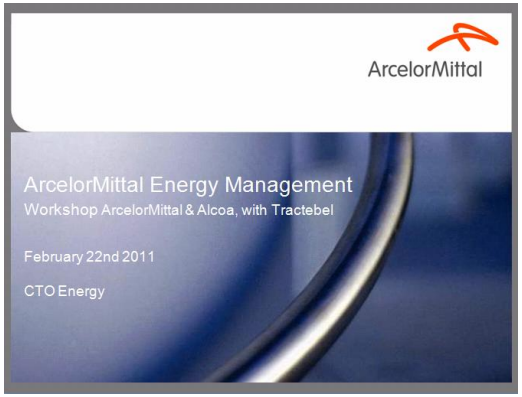
ALCOA

Tom Fenimore, PE, PEM, CEM
Energy and Utilities Consulting Services

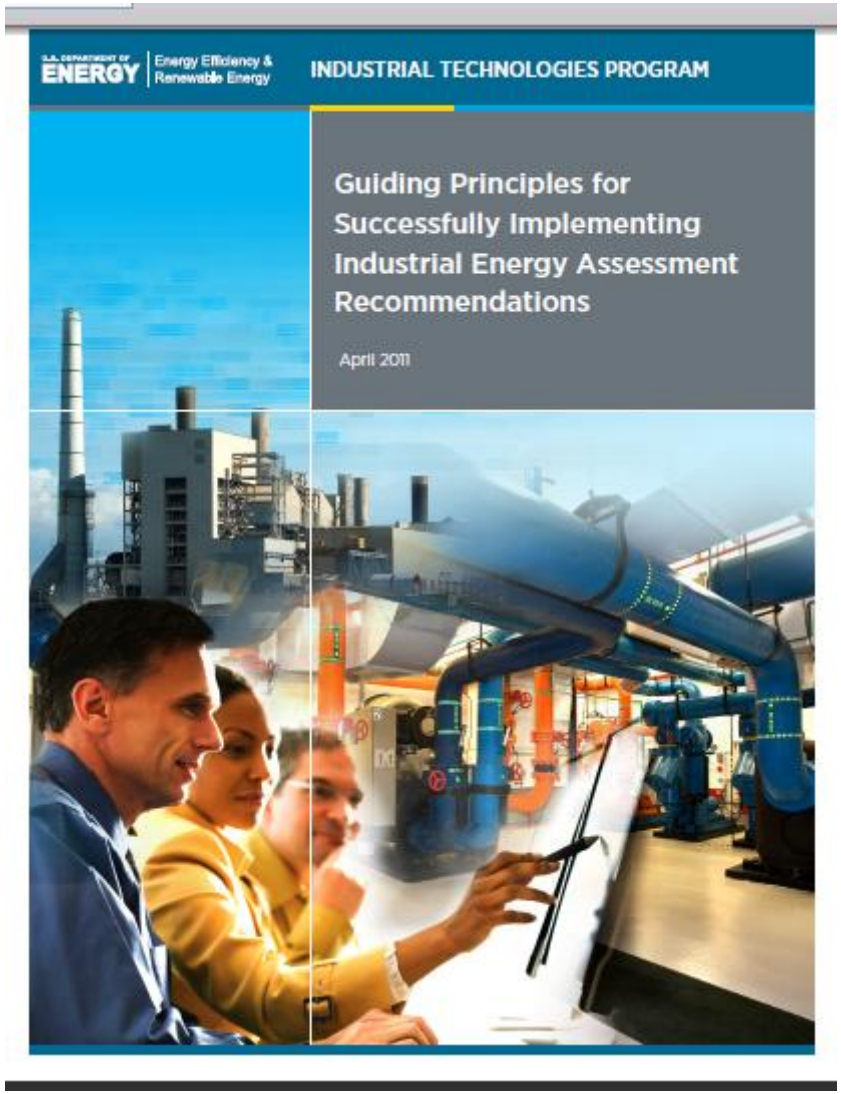
March 16, 2011

Management
Benchmarking others will accelerate our progress





Partnering with DOE



Energy – Current Situation

- Alcoa spends $3.4 billion annually on energy.
- Energy consumption is the main contributor to greenhouse gas emissions.
- Cap & Trade requirements and Carbon Tax are already a reality (Europe, Australia).

- Alcoa has sustainability goals that include reducing energy intensity
- Key to the energy intensity reduction efforts are:
  - Assuring energy is considered in all aspects of our operations
  - Rapidly replicating energy saving opportunities
  - Providing a means to link energy resources
  - Driving a culture change for employees regarding energy

Funding solutions – EE Capital Fund Planning

- **The approach:**
  - **Each business will identify a pool of capital dollars (on an annual basis but projecting for 3 years) earmarked for energy projects**
- **The Justification:**
  - **Focused effort to drive energy efficiency projects with good returns through to completion**
  - **Good return projects that historically have been cut at the plant or Group in order to meet aggressive capital spending reductions**
  - **Supports Corporate goal of decreasing energy intensity and lowering GHG emissions**
  - **Reduces unit production costs**

Principles and Process – Capital Fund

- **Plants own the project(s)**
- **Plant staff design/engineer and execute the project(s)**
- **Staff from energy efficiency group will review assumptions and financials for sanity check, but the Plant is responsible for capital budget and resulting savings**
- **Expense dollars associated with project execution as will flow to Plant books**

Process

Energy Project Funding – 2012 and beyond:

- **In 2012-15, Energy will work in concert with each Group Controller to set aside a pool of capital dollars within each Group HQ budget (split appropriately between Growth and Sustaining) to be included in the first cut of Plan (Aug/Sep timeframe).**

- **The funds will be energy specific and will be in addition to the business capital projection.**

- **Projects will be identified ahead of time (project list) then the business energy SPA and the manager of energy efficiency will prioritize the projects based on criteria listed below**

Energy focused	Replicable
Reasonable payback	High probability of success
Readiness	(except for pilot projects)

- **It is anticipated there will be more projects than funding available and a selection process will be required – The business energy SPA and Energy group will select the best projects for funding available**

Capital Funding Proposal – New Energy Efficiency Documentation

- Most capital projects (including those that are not directly focused on energy improvements) have energy efficiency opportunities.
  - Equipment choices, fuel and metering choices, material choices, technology choices.

- Include an Energy Efficiency Alternative in the Solution Analysis for capital projects greater than or equal to $2,000,000
  - Include and submit with the Advance Notification Request and the Request for Authorization.
  - Add the 'Manager – Global Energy Efficiency' to the routing and approval matrix for Advance Notification.

- This is an enabler to achieving energy intensity reduction goals.

- Applies to all new capital projects ≥ $2,000,000 with spend in 2012 and beyond.

Energy Efficiency Choice & Documentation

- Business's decision whether or not to choose the alternative that incorporates energy efficiency, considering factors such as capital cost, rate of return, support of sustainability goals, etc.
- Documentation / Justification is required for the specific reasons why a less energy efficient choice was made.
- Whether or not the energy efficiency alternative is selected, the cost information for that alternative shall be developed and made available for future energy efficiency cost comparisons.

Energy Considerations for Capital Projects

- Project and equipment layout
- Equipment overall energy efficiency
- Best use of equipment from an energy perspective
- Measurement systems
- Building envelope considerations
- Primary fuel considerations
- Manufacturing process technology considerations
- Life cycle (first cost vs. life cycle including energy cost)

Next Steps – Near Term

- Amend the “Energy Considerations” guidelines document to reflect a more practical approach to developing the energy efficiency alternative. List examples.
- Create the Energy Efficiency attachment/template for the Advance Notification and RFA. Make it global in nature.
- Reconvene the Group to review the guidelines and attachment.
- Set up a conference call with Energy President and Chief Sustainability Officer to update them on progress.
- Work with Financial Planning & Analysis to include the Energy Efficiency Review requirements in the Financial Accounting Standards for Expenditure Authorization.

Thank you!

Alcoa can't wait for tomorrow

METRUS ENERGY

U.S. DEPARTMENT OF ENERGY

Energy Efficiency & Renewable Energy

Energy Efficiency as a Resource

Industrial Technologies Program Webcasts for Industry

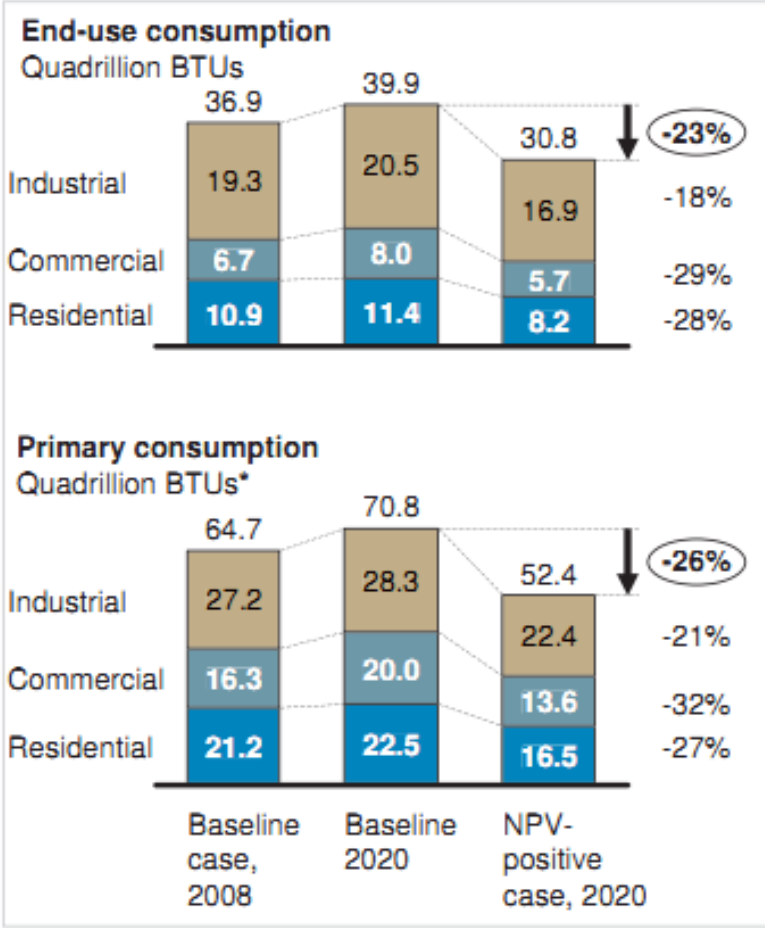
September 13, 2011

Presentation Agenda

- **State of the Energy Efficiency Market**
  - Size of the Opportunity
  - Barriers to Project Implementation
  - Current Landscape of Financing Alternatives
- **Metrus' ESA Structure**
  - Introduction to Metrus Energy
  - ESA Mechanics
- **Case Study**
  - Typical Project Profile
  - Example Project: BAE Systems
  - Sample ESA Terms & Cash Flows
- **Value Proposition**
  - Positioning to Key Stakeholders
- **Questions & Appendix**

State of the Market: The Opportunity

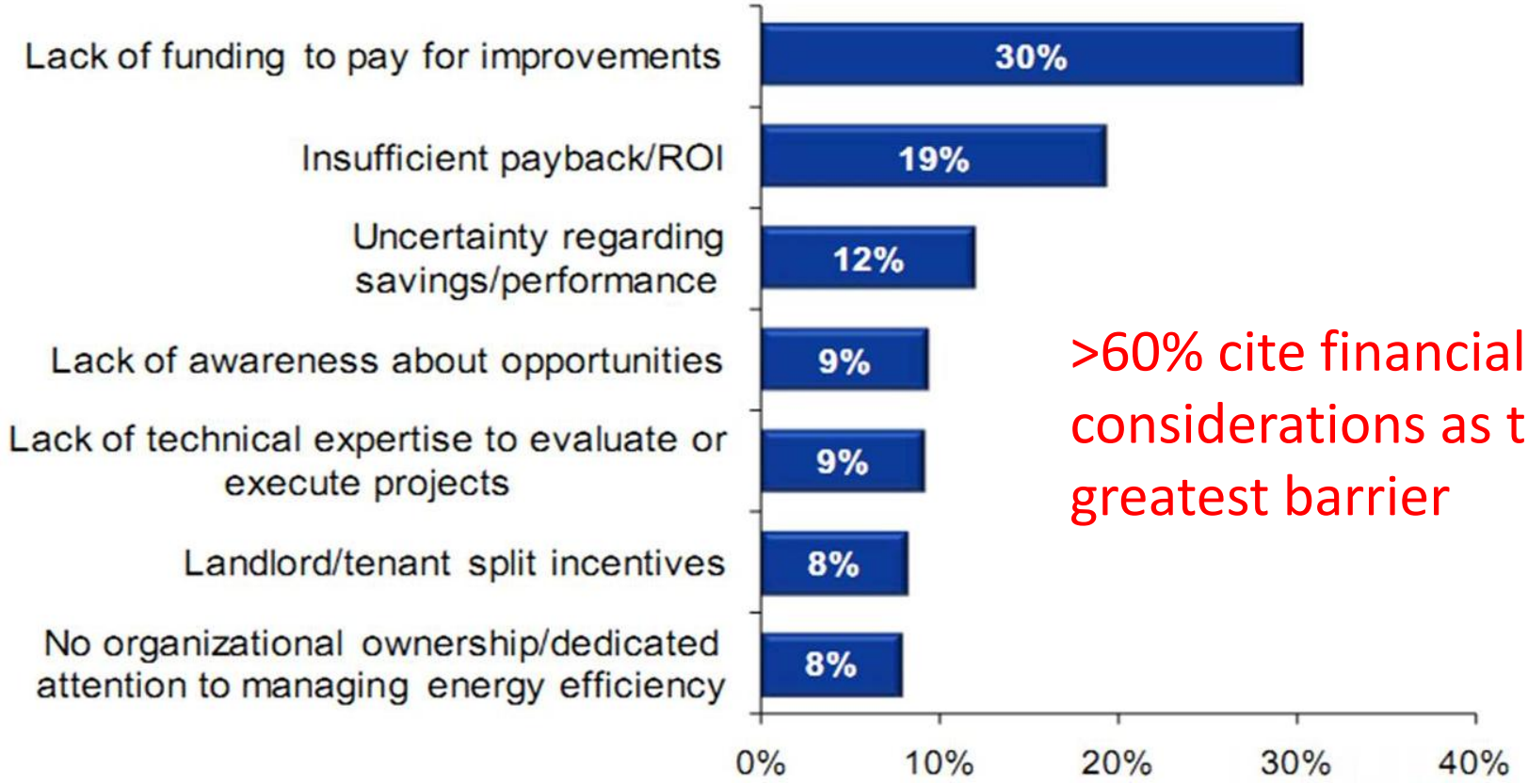
- **Significant Market Potential**
  - $250 billion investment market for private EE retrofits over the next decade (ACEEE)
  - $18 billion annual market for commercial EE retrofits (Urban Land Institute)
- **Large Untapped Annual Savings**
  - EE retrofits could yield $1.2 trillion in savings over the next decade (McKinsey)
- **Attractive Project-Level Economics**
  - High volume of EE projects with 3-7 year simple paybacks



Source: McKinsey & Company Report

State of the Market: Barriers

- When asked "What is the top barrier to pursuing energy efficiency at your company/organization":



>60% cite financial considerations as the greatest barrier

Source: Johnson Controls Institute for Building Efficiency

State of the Market: Solutions

Financing Method	Description	Pros	Cons
Self-Funding	▪ Upfront and ongoing costs of EE upgrades paid for via corporate debt and/or internal cash flow	▪ Standard capital budgeting process ▪ Captures full value of future energy savings ▪ Potentially well-established and quick decision process	▪ Requires substantial capital outlay and multiparty internal buy in ▪ Subject to internal hurdle rates and payback requirements ▪ Take on additional debt
On-Bill Financing	▪ Utility or other third party incurs upfront costs and is repaid via a charge on customers' utility bills	▪ Flexibility to be structured as either a loan (stays with customer) or tariff (stays with meter) ▪ Enhanced security	▪ Administrative barriers to supporting on-bill format ▪ Typically limited in terms of amount financed, and often does not cover long term or deep retrofits
Commercial PACE	▪ Local governments finance the upfront costs of improvements, and property owners repay the costs as a line item on property tax bill	▪ Incents deeper projects and savings with longer paybacks ▪ Leverages municipal involvement to tap into private capital	▪ Political , legal and administrative setup costs ▪ Davis-Bacon compliance requirements ▪ Mortgage holder approval required

Introduction to Metrus Energy

- **OUR COMPANY:** Headquartered in San Francisco, California, Metrus Energy is a developer, owner and financer of energy efficiency retrofit projects and a pioneer in private sector energy efficiency finance
- **OUR TEAM:** Metrus has an experienced team with backgrounds ranging from energy development to government to finance
- **OUR SOLUTION:** Metrus' Efficiency Services Agreement (ESA) eliminates all upfront costs to efficiency upgrades and turns energy efficiency into a resource for customers
- **ACCOLADES:** Metrus was selected to the White House and U.S. Department of Energy's Better Buildings Challenge as a Financial Ally, and is a partner in the AlabamaSAVES™ program

Metrus' Efficiency Services Agreement

Metrus' ESA structure eliminates upfront project costs, handles maintenance and monitoring, and functions as a dynamic energy efficiency procurement vehicle over the term of the contract

DEVELOP PROJECT

- Identify savings opportunities
- Develop entire services program
- Engage energy services partner

FUND & IMPLEMENT

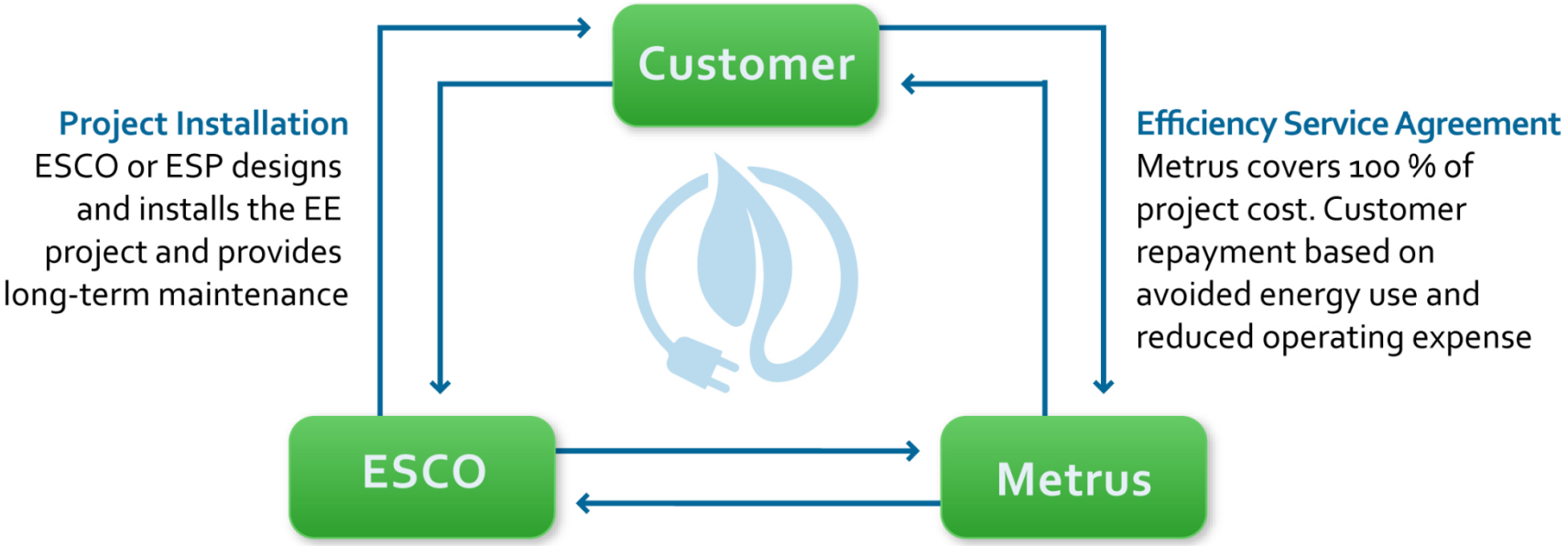
- Fund 100% of project cost
- Utilize best practices
- Minimize business disruptions

ONGOING SERVICES

- Monitor ongoing performance
- Maintain project equipment
- Identify new energy savings

Metrus' Efficiency Services Agreement

Metrus' ESA structure turns efficiency into a resource by removing all first-cost barriers and charging only for realized energy savings



Two Key Contracts: ESA & ESPC

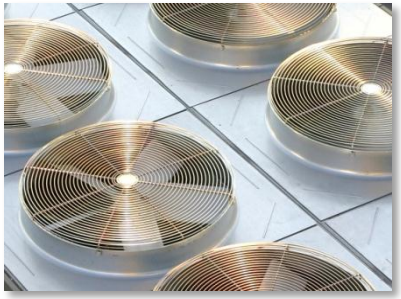
Efficiency Services Agreement

- **Parties**
  - Metrus
  - Customer
- **Metrus Role**
  - Facilitate and fund installation of project
  - Take title to all efficiency equipment
  - Pay for selected maintenance costs
- **Customer Role**
  - Make service charge payments which are based on actual project performance
- Typical contract duration = 5-10 years (periodic termination and buyout options)

Energy Service Performance Contract

- **Parties**
  - Metrus
  - Energy Services Company (ESCO)
- **Metrus Role**
  - Pay ESCO for design, installation, and maintenance services
- **ESCO Role**
  - Design and install project
  - Provide ongoing maintenance services
  - Measure and verify project savings
  - Guarantee project performance (approximately 90% of expected savings) for entire term of ESA

Typical Project Profile & Scope

Typical Project Scope

- Building automation & controls
- Lighting retrofits & controls
- Compressed air (leak detection & repair)
- Utility tariff rate optimization
- Heating, ventilation, & air conditioning (HVAC)
- Chiller replacement & system improvements
- Boiler replacement & system improvements
- Pumps, fans, motors, drives
- Cogeneration (onsite generation)

Typical Project Profile

- Clients are typically private sector commercial, industrial, healthcare and higher education
- Multiple energy efficiency measures are blended into single project scope of work
- Total project size is typically $1-5 million
- Average simple payback on a project is usually between 3 and 7 years
- Project term is typically 7 to 10 years

Customer Case Study: BAE Systems

- **Customer**
  - BAE Systems
  - Industrial manufacturing, aerospace and defense contractor
  - Multi-facility energy retrofit project
- **ESCO**
  - Siemens Industry
- **Efficiency Services Agreement**
  - 10-year ESA term
  - Service charge included both energy and non-energy savings
  - Service provider pays for all maintenance and repair/replacement on selected equipment
  - Customer has periodic buyout options
- **Project Scope (total size > $3M)**
  - Lighting retrofit and controls
  - Demand control ventilation
  - Air compressor replacement
  - Transformer replacement
  - Energy policy for IT Department
- **Project Performance (annualized total)**
  - Annual Electricity Savings >1.4M kWh
  - Annual Natural Gas Savings >150k therms
  - Various Annual Non-Energy Savings
  - $500k Annual Cost Savings
  - Annual Emissions Reduction >1200 tons of CO_2

Sample Project: Indicative ESA Terms

Example Project Characteristics

- Scope:
  - Building automation & controls
  - Lighting retrofits & controls
  - Compressed air (leak detection, repair)
  - HVAC replacement
  - Chiller replacement & system improvements
  - Boiler replacement & system improvements
  - Pumps, fans, motors, drives
- $3 million project costs
- $525,000 in total annual savings

Example ESA Terms

- 5.6 year simple payback period
- ESA contract term of 10 years
- Utility Rate: $0.09 per kWh
- Utility Escalation: 4%
- ESA Rate: $0.081 per kWh (10% discount)
- ESA Escalation: 3%

Sample Project: Cash Flows

Example Project
$3M Project
Customer Cash Flow Pro Forma

YEAR	construction	1	2	3	4	5	6	7	8	9	10	11
PROJECT SAVINGS												
Reduced Electricity Consumption, kWh	0	5,833,333	5,833,333	5,833,333	5,833,333	5,833,333	5,833,333	5,833,333	5,833,333	5,833,333	5,833,333	5,833,333
Utility Tariff, $/kWh (4.0% annual escl)	0.0900	0.0900	0.0936	0.0974	0.1013	0.1053	0.1095	0.1139	0.1185	0.1232	0.1281	0.1333
Value of Project Savings, $	**0**	**525,000**	**546,000**	**568,167**	**590,917**	**614,250**	**638,750**	**664,417**	**691,250**	**718,667**	**747,250**	**777,583**
ESA CUSTOMER PAYMENTS												
ESA Rate, $/kWh (3.0% annual escl)	-	0.0810	0.0835	0.0860	0.0886	0.0912	0.0940	0.0968	0.0997	0.1027	0.1057	-
Payment for Realized Electricity Savings	-	472,500	487,083	501,667	516,833	532,000	548,333	564,667	581,583	599,083	616,583	-
End-of-Term Payment for Fair Market Value	0	0	0	0	0	0	0	0	0	0	0	300,000
Total ESA Customer Payments	**0**	**472,500**	**487,083**	**501,667**	**516,833**	**532,000**	**548,333**	**564,667**	**581,583**	**599,083**	**616,583**	**300,000**
NET CUSTOMER SAVINGS												
Project Savings	0	525,000	546,000	568,167	590,917	614,250	638,750	664,417	691,250	718,667	747,250	777,583
ESA Customer Payments	0	472,500	487,083	501,667	516,833	532,000	548,333	564,667	581,583	599,083	616,583	300,000
Net Cash Flow, annual	**0**	**52,500**	**58,917**	**66,500**	**74,083**	**82,250**	**90,417**	**99,750**	**109,667**	**119,583**	**130,667**	**477,583**
cummulative	0	52,500	111,417	177,917	252,000	334,250	424,667	524,417	634,083	753,667	884,333	1,361,917

The ESA: Scalability & Flexibility

- Ongoing maintenance ensures continued savings
- Regular progress reports and efficiency assessments
- Dynamic program identifies and implements additional energy improvements as they become available
- Program is scalable across multiple facilities

Positioning the Value Proposition

Benefit	Description	Who Cares?
Avoid Capital Outlay	Metrus pays for all design and implementation costs, enabling customers to conserve capital for core business investments	▪ CFO ▪ Facility Mgr.
Use Savings to Pay for the Project	ESA service payments are based solely on the realized energy and operational savings created by the project	▪ Facility Mgr.
Reduce Operating Expenses	ESA service payments are set below the current utility price, which immediately improve the bottom line	▪ CFO/COO ▪ Facility Mgr.
Enhance Reliability of Operations	Under the terms of the ESA, Metrus pays for periodic maintenance services to ensure long-term reliability and performance of the project equipment	▪ CFO/COO ▪ Facility Mgr.
ESA Payments are an Operating Expense	The ESA is designed to be an off-balance sheet financing solution with regular payments similar to a standard utility bill	▪ CFO ▪ Facility Mgr.
Reduce Exposure to Utility Uncertainty	During the term of the ESA, service payments escalate at a fixed annual rate below historical utility price increases	▪ CFO/COO ▪ Procurement
Expand Feasible Project Scope	By circumventing the traditional capital budgeting process, Metrus unlocks longer (3+ year simple payback) projects with higher upfront costs and deeper operational benefits	▪ Facility Mgr. ▪ ESCO partners

Questions?

Metrus Energy

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Appendix: Frequently Asked Questions

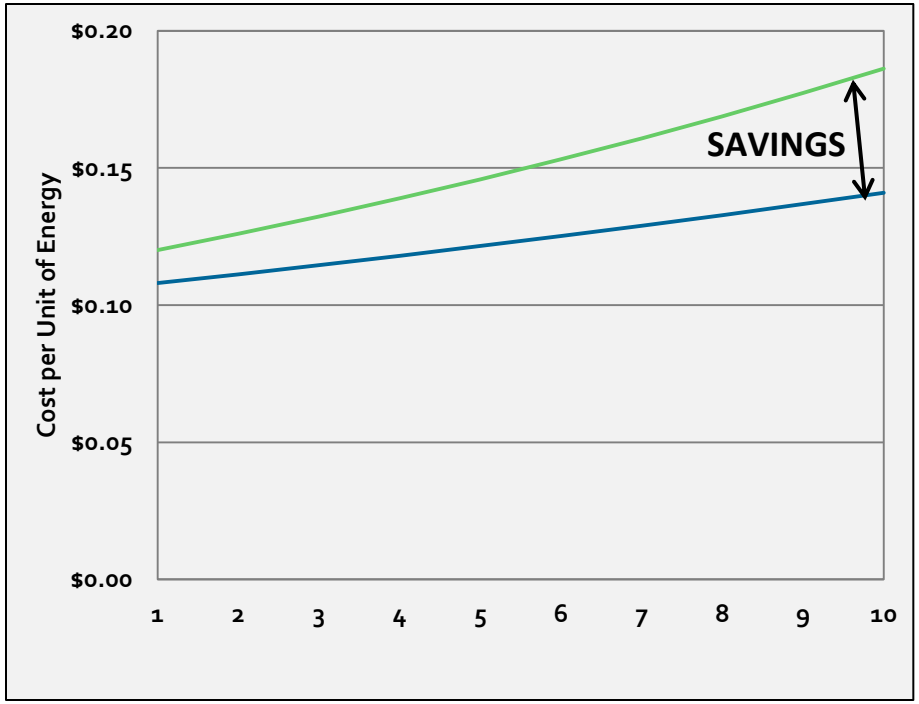
- At what point in the process does Metrus enter the conversation?
  - Metrus supports the sales cycle at any point during the development process (prior to preliminary audit or post detailed audit). Engaging Metrus early as a development resource (accounting, financial, legal) can accelerate the closing process.
- Under an ESA, who holds title to all project assets?
  - Metrus holds title to all project assets financed under an ESA, and is responsible for ensuring project performance via maintenance. Customers bear no performance or technology risk, paying only for realized savings, and have periodic termination and FMV buyout options over the term of the contract.
- For accounting purposes, is the ESA considered an "off-balance sheet" transaction?
  - The ESA is designed to be treated as a "services agreement" rather than a "lease" and Metrus customers have treated it as such. However, each customer is responsible for making its own accounting determination.
- What happens if actual savings fall above or below the ESCO's ESPC guarantee?
  - A customer pays only for realized savings. If actual savings > guarantee, Metrus and the customer "share" those additional savings (i.e., the customer pays Metrus the pre-agreed upon $/kWh price for the additional units saved. If actual savings < guarantee, the customer pays Metrus only for actual savings and Metrus.
- What happens if a customer makes operational changes that impact the baseline?
  - The ESA is structured to cover technical, but not operational or behavioral risks associated with a project. Operating hours are typically a stipulated component of IPMVP calculated savings. For example, if a customer reduced the number of shifts in a facility from 3 to 2, realized savings and ESA payments) would be calculated based on 3 shifts. Alternatively, the customer would have the option of early termination/buyout.
- What happens if the customer sells the facility during the ESA term?
  - The customer may elect to (1) terminate the ESA prior to end of term subject to breakage costs, (2) purchase the covered equipment at FMV, or transfer the ESA to the new building owner subject to Metrus credit approval.

Appendix: Typical Development Process

Process Step	Description
Facility Screening	Metrus works with customer and ESCO/contractor(s) to evaluate potential savings
Mutual Non-Disclosure Agreement	Transfer of information initiated (e.g., customer's audited financials, utility billing information, ESA structure/pricing)
Letter of Intent	Letter details key project development activity and timeline
Preliminary Scoping Study	Energy contractor(s) summarizes potential EE improvements and associated operational and economic benefits
Project Agreement	Binding project agreement summarizes the criteria that will be used to determine if the final project scope is acceptable; if the final recommended scope is acceptable and customer does not proceed with ESA, customer pays breakage fee
Investment Grade Energy Assessment	Energy contractor(s) provides detailed costs and savings, which forms the basis for the design, engineering and construction activities
Efficiency Services Agreement	Metrus enters into ESA with customer detailing project scope, operation and measurement and verification protocols
Efficiency Services Performance Contract	Metrus project company enters into ESPC with contractor(s), addressing all EPC work as well as ongoing maintenance, repair and replacement, monitoring and performance guarantee

Appendix: ESA Service Charge

Service Charge = (Physical Units of Savings) * (Service Rate, $/unit) + Non-Energy Savings



Billing Period	Quarterly
Basis	Quantity of energy units saved (e.g., kWh of electricity)
Service Charge	$ per unit of energy units saved
Non-Energy Savings	% of non-energy savings that are attributed to project operation
Annual Escalation	Service charge escalates at a fixed annual rate

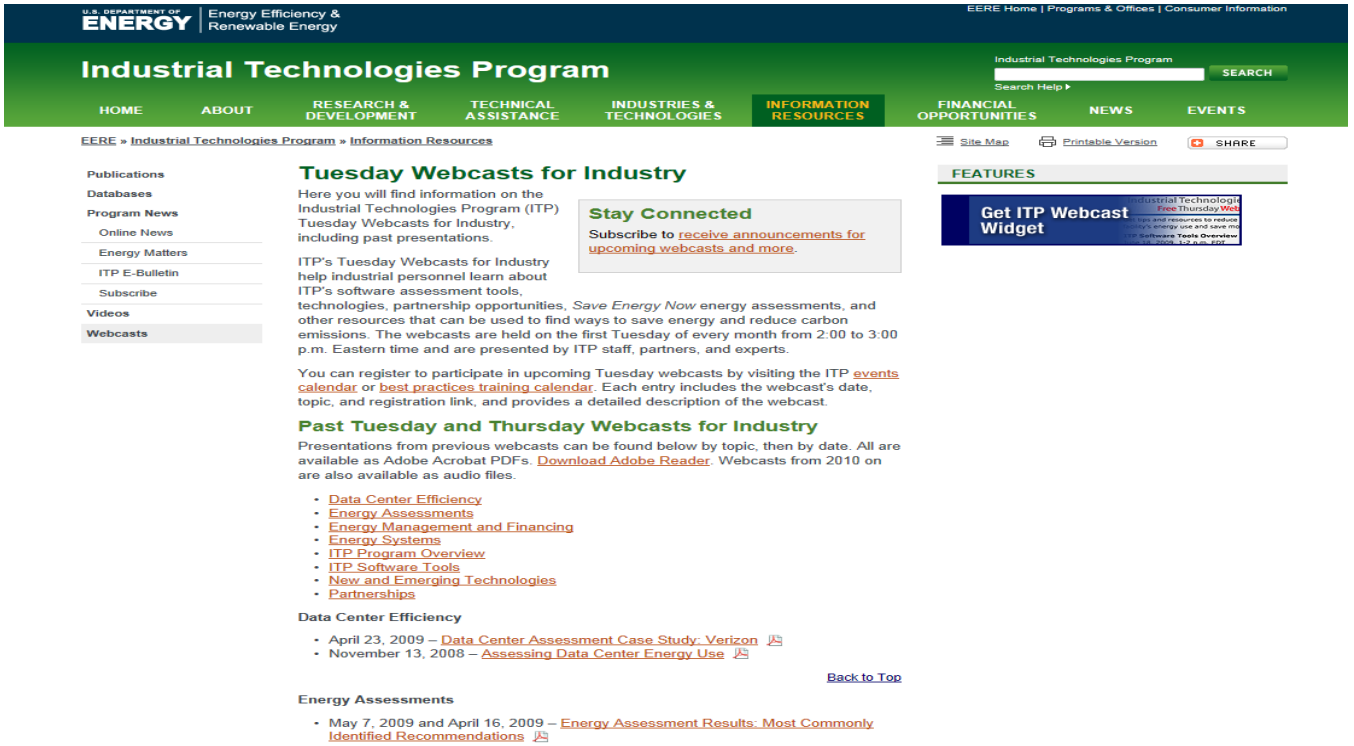
- Savings created by:
  - Year 1 Service Charge is ≤ Avoided Utility Cost
  - Fixed Annual Escalation is ≤ Expected Utility Rate Increase

Appendix: Measurement & Verification

- Service charge payments are based on actual project performance and energy savings, as defined by measurement & verification (M&V)
- At the end of each billing period, ESCO prepares an M&V report to quantify the project's performance and energy savings
- International Performance Measurement & Verification Protocols have been used in the efficiency industry for decades:

Stipulated	Savings are defined by engineering analysis. All parties review and approve the analysis prior to executing contracts. The quantity of energy savings does not vary during the ESA term.
One-Time Measurement	Savings are defined by measurements taken before and after installation. After the measurements are completed, savings become stipulated and do not vary during the ESA term.
Ongoing Monitoring	Savings are defined by monitoring the actual performance of project equipment and systems during each billing period. Actual energy savings vary over time.

Slides from Previous Webcasts



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Next Month's Webcast

Please join us for our next Webcast.

Topic: Unveiling the Implementation Guide

Presenter: Steve Fugarazzo of Raytheon and Michaela Martin of Oak Ridge National Laboratory

Date and Time: Tuesday, October 11 at 11:00 a.m. PDT/2:00 p.m. EDT

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