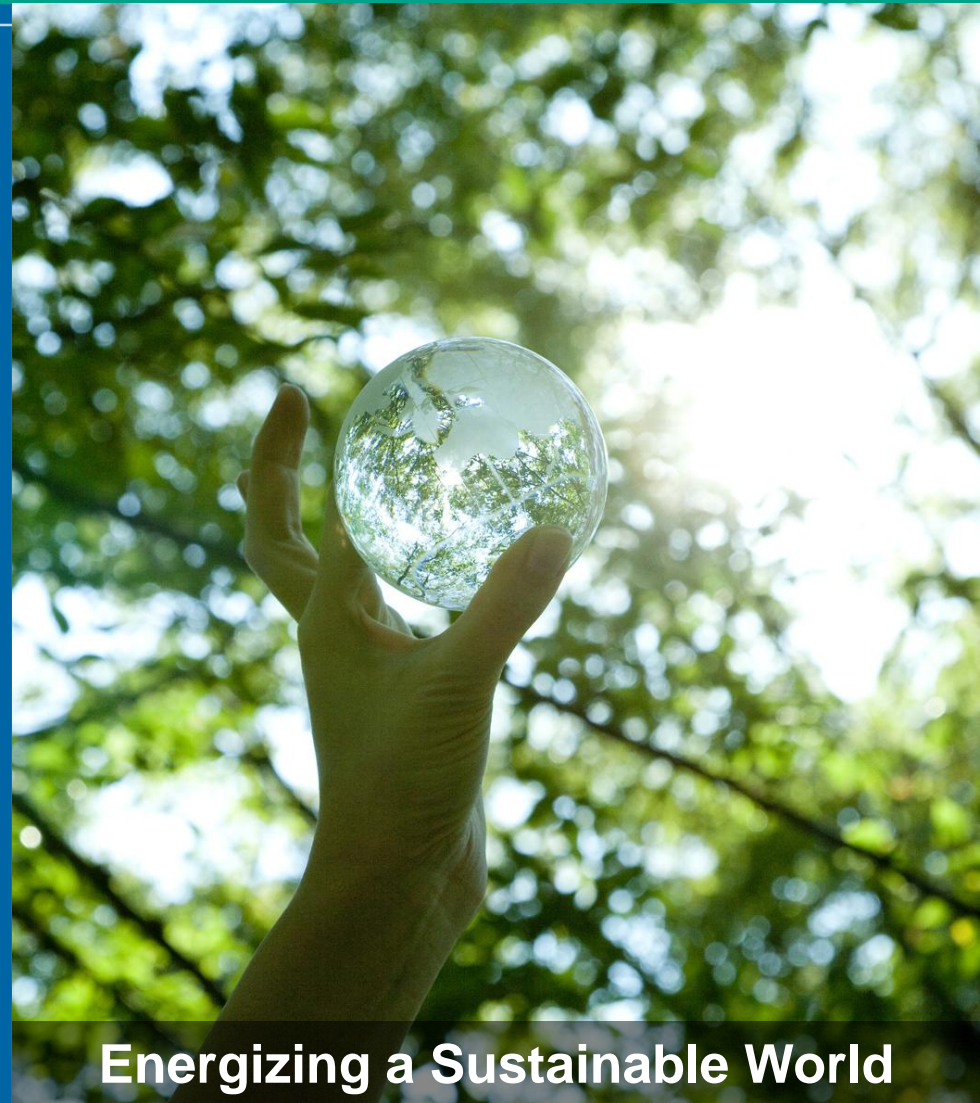


# The Big Energy Summit

U.S. Experience in Developing  
Municipal Scale Energy  
Management Systems

February 26, 2015

Presented by:  
David J. Anderson  
Executive Vice President



**Energizing a Sustainable World**

**AMERESCO**   
Green • Clean • Sustainable

# Agenda

- Ameresco Overview
- U.S. Enabling Legislation Summary – Federal & State
- Business Climate
- Project Structure & Financing
- Customer Case Studies

# Ameresco Overview



# Ameresco Overview

- **Incorporated in April 2000; Public in 2010, NYSE:AMRC**
- **Leading sustainability partner** providing creative and customer-valued energy savings and renewable solutions
- **Independent** – not a manufacturer, utility or subsidiary
- Technology and equipment neutral
- \$5 Billion in energy solutions delivered; over \$1.4 billion of projects currently in development/construction
- Significant experience in municipal, state and federal government, including education, healthcare, commercial, industrial and retail
- Acquired **Energyexcel LLP**, an independent energy services provider located in Central London in August 2014
- Acquired **Energy Services Partnership (ESP)**, a leading provider of innovative energy management solutions located in Castleford in June 2013
- 69 offices throughout North America and the United Kingdom
- More than 1000 employees

# Integrated Services

## Sustainability Partner



Ameresco offers a comprehensive array of energy solutions to address energy at every stage – before, at, and after the meter – and on an integrated basis supporting best practices and customer value.

Intelligent Systems	Energy Efficiency	Renewable Energy	Energy Infrastructure	Energy Supply
Utility Bill Analysis, Processing & Payment	Energy Savings Performance Contracting	Power Purchase Agreement	Asset Monetization	Utility Budgeting
Energy Star Reporting	Demand Side Management	Solar Grid-Tie: Rooftop, Ground-mount	Plant Rehabilitation	Commodity Procurement
Green House Gas Tracking & Reporting	Demand Response	Solar Off-Grid	Facilities Management	Rate Analysis Negotiation
Automated Demand Response	Turnkey Design/Build	Solar Thermal	On-site Cogeneration	Price Risk Mitigation
Intelligent Energy Savings Solutions	Facility Renewal	Landfill Gas	Distributed Generation	Green House Gas Management
Invoice Management	LEED Construction	Biogas		Renewable Energy Credits
Asset and Capital Planning	Power Quality & Reliability	Biomass		
Intelligent Wireless Sensing	Energy Waste Services	Geothermal		



# Our Approach *emphasizes certainty of return on invested capital*

## CONTROL

Behaviors

- Real-time energy, water & carbon data
- Enterprise-wide
- Software as a service technology

## REPLACE

Inefficiencies

- Energy efficiency project development, design & implementation
- Auto-demand response

## SHIFT

to Clean Generation

- Cogeneration, bio-gas, bio-mass and solar
- Operate and maintain existing facilities using best practices

# U.S. Enabling Legislation Summary – Federal & State



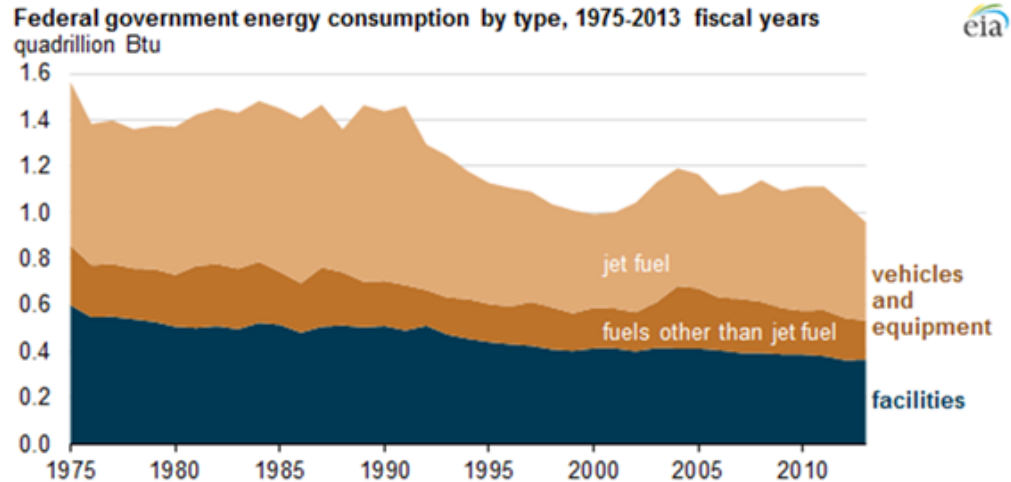
# Federal Enabling Legislation for Privately-delivered Energy Efficiency

- In 1992, Congress passed the Energy Policy Act which established energy savings requirements for Federal agencies; this also provided the enabling authorization for agencies to use private-sector financing through Energy Savings Performance Contracts
- In 1994, President Clinton issued Executive Order 12902 which extended the EPACT energy efficiency goals for Federal agencies and encouraged the use of ESPCs to meet those goals
- In 1999, President Clinton issued Executive Order 13123 which again extended the Federal energy efficiency goals and then required each Federal agency to reduce greenhouse gas emissions from energy use in buildings
- In 2005, Congress again extended the energy efficiency requirements for Federal agencies and extended the authorization for the use of ESPCs to meet those goals



# Federal Enabling Legislation for Privately-delivered Energy Efficiency

- In 2007, Congress passed the Energy Independence and Security Act which permanently reauthorized Federal agency use of ESPCs
- Currently, Federal agencies may enter into an ESPC for a period of up to 25 years for the purpose of achieving energy savings and benefits ancillary to that purposes, including renewable energy



Site-Delivered Energy Use, Costs, and Gross Square Footage of Federal Facilities, FY 2013		
Billion Btu	Million \$	GSF (Thou.)
366,247.0	\$6,830.0	3,172,663.3

Source: 2013 data from DOE.

# State Enabling Legislation for Privately-delivered Energy Efficiency

- The use of non-ratepayer funded energy efficiency, i.e. privately-delivered energy efficiency through the ESCO model, is regulated at the state-level (not Federal) and varies by state (and it is not regulated by the Public Utilities Commission)
- All states have some form of legislation which addresses, or may encourage, the use of alternative financing and/or ESPCs in some segment of buildings, either state-owned buildings, school districts, and/or municipal buildings
- Typically, state legislation is required to authorize the use of ESPCs and to provide guidance on whether the use of private financing has state or local debt implications
- This legislation varies by state and there are varying contract term limitations on the use of ESPCs across different types of building owners (i.e. municipal or school district) which typically range between 10-20 years

# State Enabling Legislation for Privately-delivered Energy Efficiency

**Table ES- 1. Median ESCO market penetration estimates: % of total market floor area addressed by performance-based contracts since 2003**

Market Segment	U.S. Census Region				
	Northeast	Midwest	South	West	U.S.
<b>K-12 Schools</b>	45%	40%	42%	30%	42%
<b>State / Local</b>	39%	30%	30%	45%	30%
<b>Federal</b>	27%	28%	25%	27%	28%
<b>Universities/Colleges</b>	25%	25%	23%	30%	25%
<b>Public Housing</b>	20%	15%	18%	18%	18%
<b>Health/Hospitals</b>	10%	10%	15%	15%	10%
<b>Private Commercial</b>	10%	6%	8%	9%	9%

# EPA Clean Power Plan

- In 2014, the U.S. Environmental Protection Agency (EPA) released the Clean Power Plan, a proposal aimed to cut carbon pollution from the existing U.S. power sector by 30 percent by 2030 compared to 2005 levels
- This is the most significant U.S. climate action policy undertaken to regulate and reduce greenhouse gas emissions from the power sector nationwide
- The plan derives its authority to regulate air pollutants under the Clean Air Act, Section 111(d)
- The historic plan was issued under the direction of President Obama and will regulate CO2 emissions during the period of 2020-2030



The combustion of fossil fuels to generate electricity is the largest single source of CO2 emissions in the nation, accounting for about 38% of total U.S. CO2 emissions and 31% of total U.S. greenhouse gas emissions in 2012.

Source: EPA, [http://www.epa.gov/climatechange/ghge\\_missions/gases/co2.html](http://www.epa.gov/climatechange/ghge_missions/gases/co2.html).

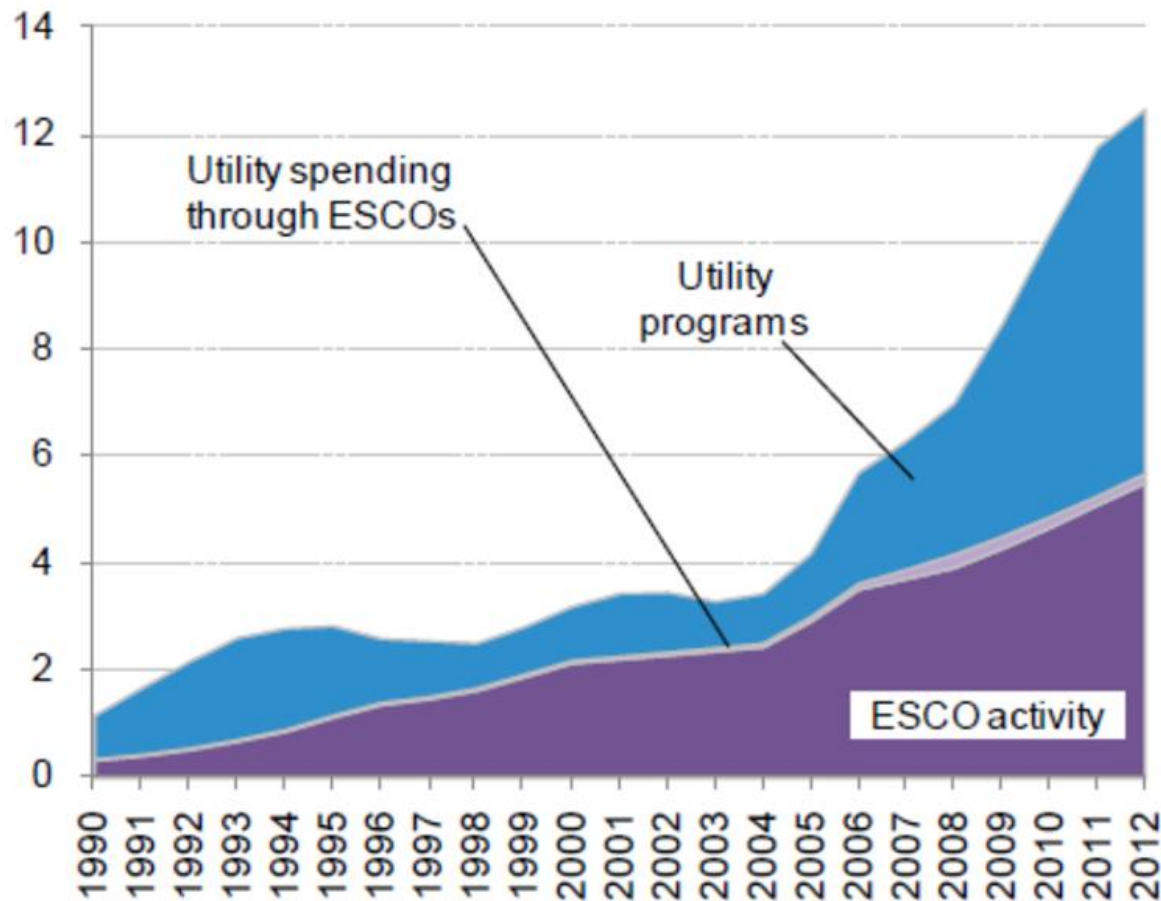
# Business Climate





# Energy Efficiency

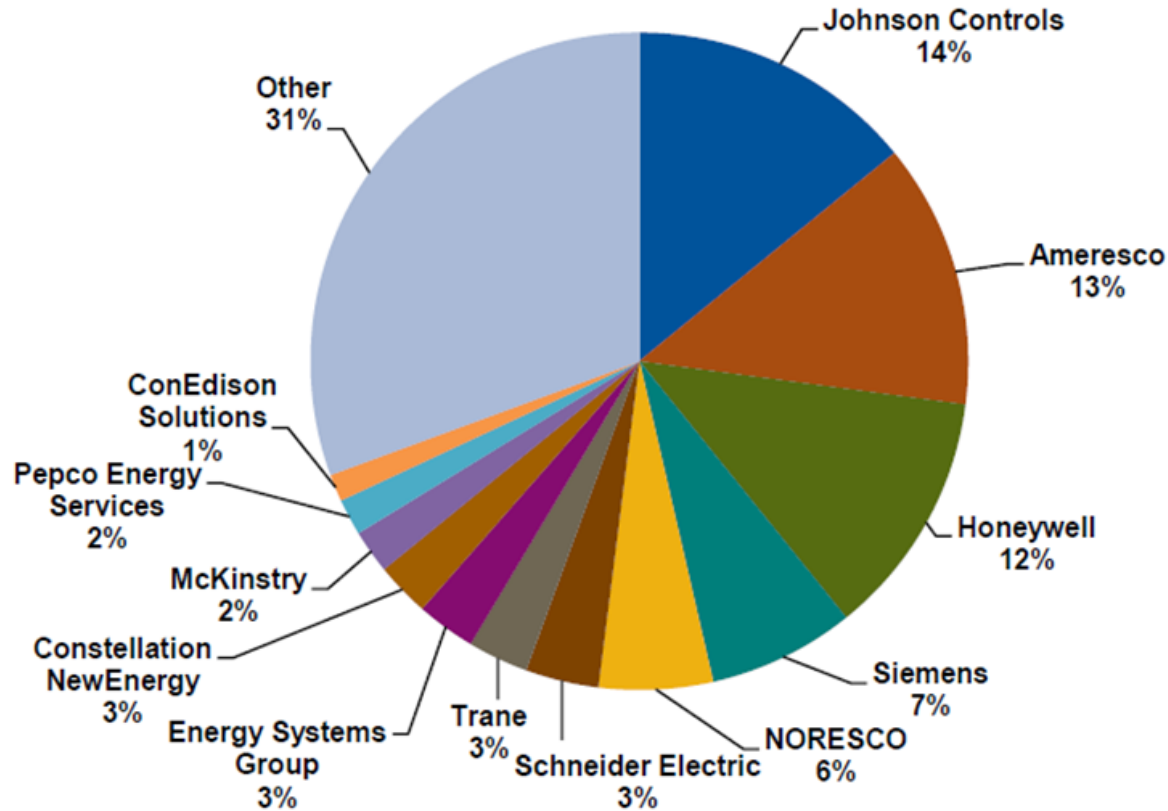
Investment in energy efficiency through ESCOs and utility programs, categorized by program, 1993-2012, (\$bn)





# ESCO Revenue Market Share by ESCO, United States 2011-2015

ESCO Revenue Market Share by ESCO, United States: 2011-2015



(Source: Navigant Research)

Source: Navigant Research: The U.S. Energy Service Company Market - Energy Performance Contracting and Energy Efficiency Retrofits for the MUSH, Federal, Commercial & Industrial, and Public Housing Sectors - Published 3Q 2013

## Current Market Drivers

- Utility Rates
- Cost of Capital
- Availability of Big Data, Analytics and Information
- Customer Need
  - Aging Infrastructure
  - Budgetary Constraints
  - Lower Operating Costs
  - Improve Building Performance
  - Reduce Carbon Footprint
  - Increased Awareness of Efficiency Measures
  - Sustainability Goals and Compliance Requirements
- Federal and/or State Regulations

# Municipal Benefits

- Upgrade or renew facilities with no up-front cost
- Reduce energy consumption and operating costs
- Energy and water cost savings
- Increase occupant comfort
- Mitigate energy-related risks and costs
- Implement renewable or new energy strategies
- Achieve sustainability and environmental goals

# Project Structure & Financing

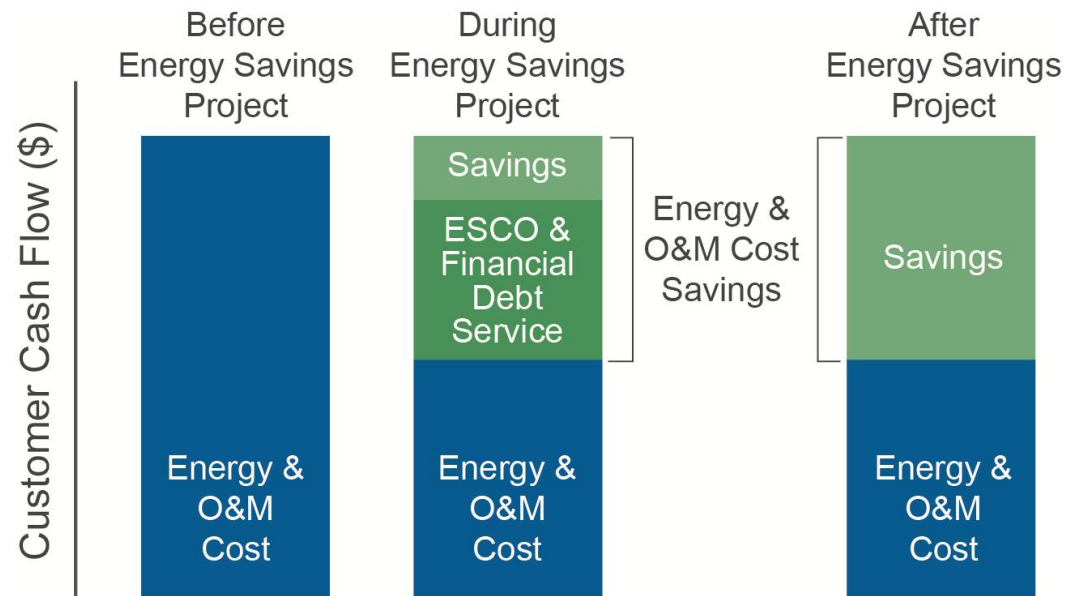


# Project Structure

- Design/Build
- Energy Savings Performance Contract
  - Guaranteed Savings
- Design/Build/Own/Operate and Maintain
- Fee for Service
  - Supply Management
  - Operation and Maintenance Contract
  - Measurement and Verification Contract
  - Invoice Management

# Energy Savings Performance Contract

- Customers can renew facilities and reduce energy costs without the need for capital expenditures
- The energy upgrades are paid for by a portion of the cost savings resulting from these improvements over a set term
- At the end of the ESPC, the customer receives all of the continuing savings





# Financing Options

- ESPC
- PPA
- Leases
- Bonds
- Utility Incentives
  - Rebates
  - Demand Response
- Government Subsidies, Grants or Interest Free Loans
- Tax Incentives
- Clean Energy Attributes
  - Renewable Energy Credits
  - Carbon Trading

# Customer Case Studies



# Architect of the Capital, U.S. Senate Office Buildings

- Contract Type: ESPC
- Construction Completed: November 2012
- Project Value: £30.9 million (\$47.6 million)
- Annual Savings: £2.5 million (\$3.9 million)
- 2.4 million square feet
- Energy Conservation Measures
  - Lighting Systems Upgrades
  - Centralized Dimming System Expanded
  - Integration of Lighting Occupancy and Daylight Sensors
  - BAS/DDC Systems and Overall Controls Upgrades
  - Transformer Upgrades to High Efficiency
  - HVAC Upgrades and Rebalancing
  - Work performed in High Security Areas



# Savannah River, Biomass Cogeneration



- £517.6M (\$795M) contract by the Department of Energy to construct a biomass cogeneration facility and two smaller biomass heating facilities at the DOE's Savannah River Site in Aiken, SC.
- Largest renewable energy performance contract in US history.
- Facility design capacity of 240,000 pounds per hour (pph) of steam and 20 MW of electric power.
- Cost savings in excess of £22M (\$34M) and site's greenhouse gas emissions will be reduced by over 100K (tons).
- *Reduction* of 400 tons/yr of Particulate Matter (PM) emissions; 3,500 tons/yr of Sulfur Dioxide emissions & 100,000 tons/yr of Carbon Dioxide emissions

# Boston Housing Authority, MA

- Initial investment £44.1M (\$67.7M)
- Annual savings of £3.1M (\$4.8M) over 20 years
- 4,300 units in 13 developments
- The largest Public Housing Performance Contract in U.S. History
- Energy conservation and renewable energy measures including:
  - Lighting (common areas and apartments)
  - Water conservation measures
  - Replace DHW systems
  - Install limiting thermostats
  - Upgrade boiler controls
  - Replace steam traps
  - Upgrade HVAC equipment
  - Replace windows and roofs
  - Install packaged cogeneration unit
  - Install solar PV system





# City of Miami Beach, FL

- The Miami Beach Convention Center gets national recognition with its new water chilling plant (part of a £9.1M (\$14M) City-wide upgrade)
- The President wanted to draw attention to the City's efficiency efforts as "a model for public facilities across the country."
- Energy Conservation Measures include:
  - Facility lighting and lighting controls
  - Domestic water conservation
  - HVAC controls & Energy Management Systems
  - Geothermal District Cooling Plant;
  - Energy efficient power transformers
  - The strong partnership between the City of Miami Beach (CMB) and Ameresco resulted in Ameresco appointment to CMB's Sustainability Committee.
- 50 Buildings, Term: 13 years
- Total Square Footage: 2,600,000
- Total Contract Amount: £9.1M (\$14M)
- Guaranteed Annual Savings: £781,320 (\$1.2M)



*Miami Beach's New Water Chilling Plant Gets White House's Attention*  
*President Obama's chief environmental advisor, Nancy Sutley, came to the convention center for an up-close look Tuesday. "She was pretty impressed"*



# City of Newburyport (Solar PV), MA

- After the original developer could not complete the project, the City of Newburyport selected Ameresco to design, build, own and operate two solar PV systems. For this project, Ameresco helped the City install solar PV on their Department of Public Works warehouse while sending all the monetary credits to the school – something that has not been done in Massachusetts before.
  - 1st Solar Power Purchase Agreement in Massachusetts
  - 1st Net metered solar PV facility in Massachusetts
- 20 Year Power Purchase Agreement
- Total System Size: 502 kW DC
- Expected First Year kWh Output: 535,000 kWh
- Structural reinforcements to the DPW Warehouse were included to meet structural requirements for a larger system installation
- As winner of the “Win with Canadian Solar” vendor award, Ameresco was awarded £326(\$500) which was donated to the City and matched with an additional £326 each from Ameresco and Munro Solar.



*“This project has been a win-win for Newburyport,” said Mayor Donna Holaday. “Not only are we using clean renewable energy but are also **modeling innovation and responsible energy usage for our students, teaching staff and the community at large.** It is a demonstration of our commitment to the future which is also vital to our **economy, history and heritage.**”*

- 19 Municipal Facilities and 28 Schools, 23 energy & water conservation measures, 47 buildings
- £13.7M (\$21.1M) Energy Savings Performance Contract;
  - 20 Year Repayment Term Utilizing Guaranteed Energy Savings
- Power Purchase Agreement
  - Nearly £651.1K (\$1M) of Utility Rebates
  - Solar/PV PPA: Ameresco designed, installed, commissioned, owns, operates, and maintains (20 Years)
  - Phase I: 5 solar PV roof-mounted systems on four schools and the Lowell Memorial Auditorium.
  - Phase II: Solar PV project on the City's capped landfill.
- Lowell Housing Authority
  - A £5.9 (\$9M) energy savings performance contract that included energy conservation measures such as Lighting retrofit and controls, energy Management Systems, water conservation, insulation/weather proofing, boiler plant decentralizations, replacement HVAC equipment



## Savings Generated (Post-Construction)

- ✓ £991,461 (\$1,522,679) annually in Guaranteed Savings
- ✓ \$1.8 MW Solar/PV Capacity
- ✓ **25% in Savings** Off the Total Annual Operational Spend

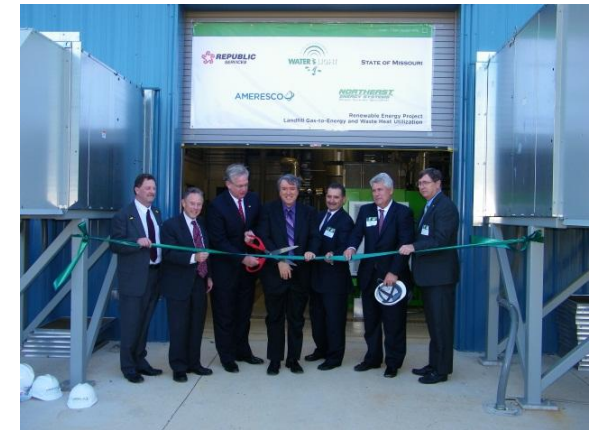
# San Antonio Water Systems, Sale of Renewable Fuels

- Build, Own and Operate
- SAWS located in Bexar County, TX
- Developed under 20-Year Partnership
- Biogas generated during the sewage treatment process is cleaned and transferred to a natural gas pipeline
- 900,000 CF of digester gas processed
- SAWS receives a royalty on the sale of the gas, reducing the cost of SAWS operations
- First large waste water utility to partner with a private developer to harvest biogas for sale in the United States



# Jefferson City / State of Missouri, Cogeneration with LFG

- Awarded 2009 Project of the Year by the U.S. EPA
- 3.2 MW LFG to Energy Project
- The biogas is piped to the engines located on property owned by the State of Missouri.
- The waste heat from the engines is used by two state-owned prisons to meet their thermal needs
- Power is wheeled through Ameren and sold to Columbia Water and Light





- Comprehensive energy relationship - most successful and elaborate energy in the US.
- Began in 1999 focused on energy saving projects implemented without additional capital outlay.
- £153.7M (\$236.0M) of facility and infrastructure upgrades with more than £9.1M (\$14.0M) per year of savings
- Supported the ASU School of Engineering with guest lecturers and class project support
- In 2013 ASU and Ameresco executed a Strategic Business Partnership Agreement for ASU to reach complete carbon neutrality by 2025. First of its type in the US



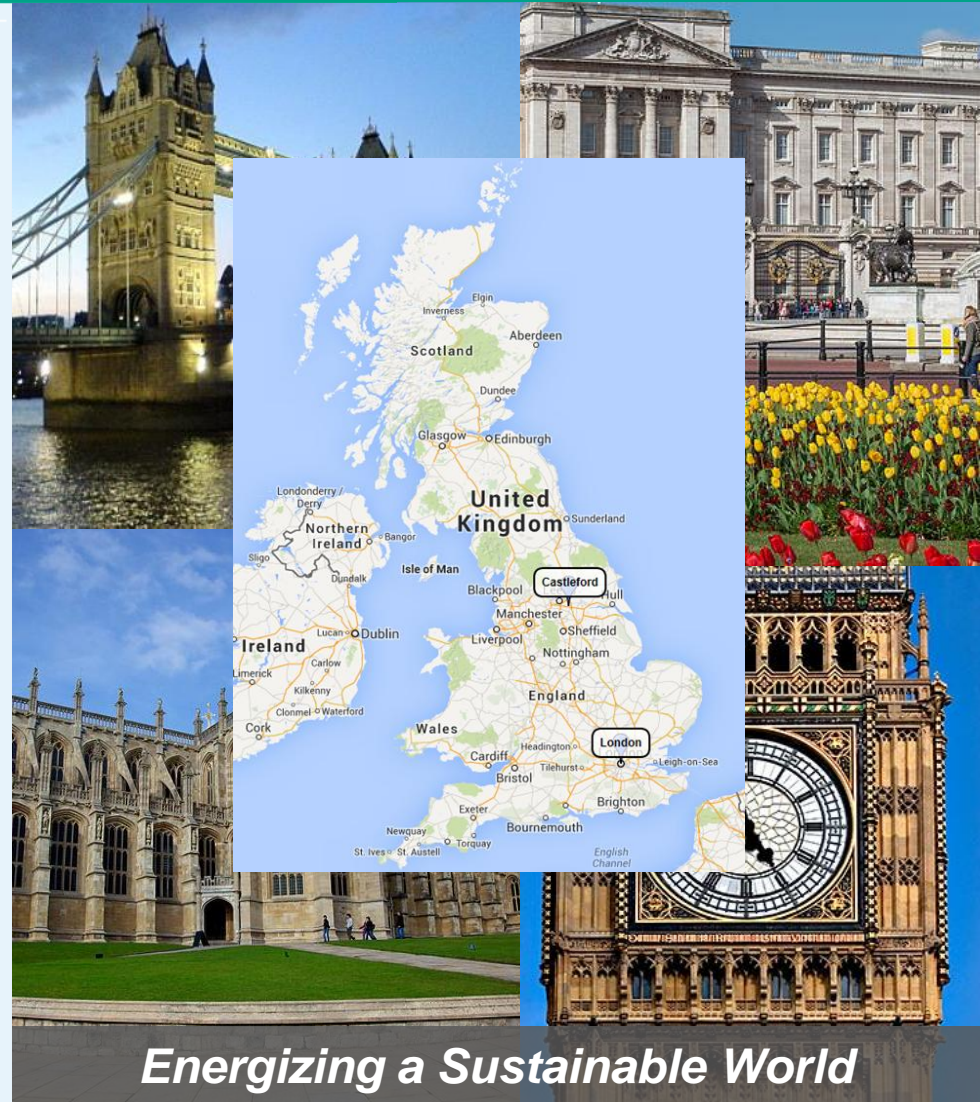
Thank you

Local Contacts:

Derek Dixon or Kath Chapman  
Ameresco  
Wesley House, 5 Wesley Street  
Castleford WF10 1JGW, UK  
0871 230 1824

Tony Coleman or Dipak Shah  
Ameresco  
60 Buckingham Palace Road  
London, SW1W 0AH, UK  
+44 20 3542 8300

Case studies can be seen at:  
[www.ameresco.com/page/video-library](http://www.ameresco.com/page/video-library)



*Energizing a Sustainable World*