

DOE Technical Assistance Program

U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy



The Parker Ranch installation in Hawaii

Energy Savings Performance
Contracting:
The Investment Grade Audit
July 21, 2011

**ARRA EECBG Recipient
Webinar Series**



Welcome to today's session for state and local grantees on Energy Savings Performance Contracting (ESPC): The Investment Grade Audit (IGA)

Some tips before we get started...

- All attendee phone lines are muted
- Session will be recorded
- Please submit your questions via the **Questions** window
- As many questions as possible will be answered during the session
- Presentation slides will be sent to attendees a few days after the training

What is TAP?

DOE's Technical Assistance Program (TAP) supports the Energy Efficiency and Conservation Block Grant Program (EECBG) and the State Energy Program (SEP) by providing state, local, and tribal officials the tools and resources needed to implement successful and sustainable clean energy programs.





How Can TAP Help You?

TAP offers –


- One-on-one assistance
- Extensive online library, including –
 - Webinars
 - Events Calendar
 - TAP Blog
 - Best practices and project resources
 - Facilitation of peer exchange

Topics include –

- Energy efficiency and renewable energy technologies
- Program design and implementation
- Financing
- Performance contracting
- State and local capacity building

Access the TAP Blog!
<http://www.eereblogs.energy.gov/tap/>

Provides a platform for state, local, and tribal government officials and DOE's network of technical and programmatic experts to connect and share best practices on a variety of topics.



Technical Assistance Program Blog

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy

Local Energy Rebate Programs

June 11, 2010 11:19 | [Comments \(1\)](#)

Maggie from Florida asks: Anyone implement an energy rebate program at a local level? Is it being managed by staff or was it contracted out competitively? Any advice on how to best implement/manage such a program?

The TAP Team responds: There are quite a few good examples of energy programs offered at a local level that offer rebates, technical assistance and other incentives. A few of these include the following:

- The City of Charlottesville and Albemarle County in Virginia jointly formed the Local Energy Alliance Program (LEAP) which is creating and administering energy efficiency (EE) programs for the residential sector. The Southeast EE Alliance (SEEA) seed funded the creation of LEAP in 2009 and the county and city have each allocated EECBG funds for LEAP to take programs to scale. They are currently working on rebates, incentives, and a local contractor network to deliver services to the residential sector. LEAP site: www.leap-va.org
- The town of Babylon, New York has rolled out the Long Island Green Homes Program in which residents can make energy efficient improvements to their homes at little or no cost and without assuming new debt through some innovative municipality-based financing initiatives. <http://www.townsofbabylon.com/whatsnew.cfm?id=252>
- The Cambridge (Massachusetts) Energy Alliance is a not-for-profit organization created to save residents money, while reducing Cambridge's carbon footprint. The Alliance is working with homeowners, businesses and institutions across the city to achieve unprecedented levels of energy savings and to expand clean energy sources. They offer:
 - Comprehensive energy assessments/audits for Cambridge buildings, generally for free
 - Up to 30% reductions in energy bills
 - Energy efficiency upgrades with no up front cash required
 - A one-stop energy solution with guaranteed quality
- See: <http://www.cambridgeenergyalliance.org/>
- The ClimateSmart programs are run by the City of Boulder, Colorado's Office of Environmental Affairs. For information on Boulder's programs, see: http://www.bouldercolorado.gov/index.php?option=com_content&view=article&id=1059&Itemid=396

The management of these programs varies. The municipalities listed above include both municipal staff tasked with running these programs and others that have an outside non-profit organization providing services on behalf of the municipality. There are other examples of municipalities that outsource these services to for-profit consulting firms (Charleston, SC is about to put out an RFP to hire one).

There is not one best way to go on implementing/managing municipal EE programs. There are good reasons and justifications for each of these three models. If the municipality is

BLOG HOME

PAGES

- [TAP Blog Policy](#)

ABOUT THE BLOG

The Technical Assistance Program Blog provides a platform for state, local, and tribal government officials that receive funding from the DOE State Energy Program and Energy Efficiency and Conservation Block Grants to connect with technical and programmatic experts and share best practices about their renewable energy and energy efficiency programs. Can't find what you're looking for? Contact the TAP Blog Team via email to suggest a topic or submit materials you'd like to share.

RELATED LINKS

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- [Office of Energy Efficiency and Renewable Energy](#)
- [Weatherization & Intergovernmental Program](#)
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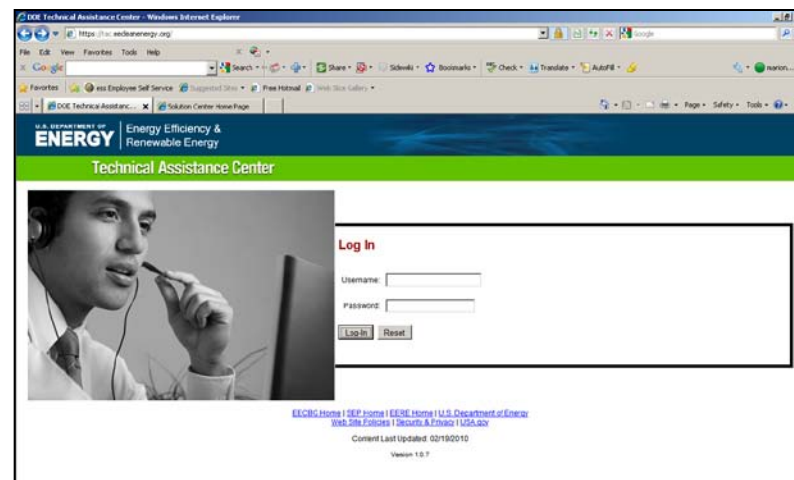
Accessing TAP Resources

We encourage you to –

1) Explore our online resources
via the [Solution Center](#)



2) Submit a request via the
[Technical Assistance Center](#)



3) Ask questions via our call center at
1-877-337-3827 or email us at
solutioncenter@ee.doe.gov



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Today You Will Learn

- What is an Investment Grade Audit (IGA)
- What to Expect with an IGA
- How to Ensure IGA Success
- What happens during a facility visit
- What is an Energy Baseline
- What are key IGA results and decision items
- What are potential IGA shortcomings
- What to expect in an IGA report
- Available resources





What is an Investment Grade Audit (IGA)

- A detailed account of energy and water use
- Cost/savings analysis of potential energy and water savings opportunities
- Project proposal of bundled measures, with a financing plan as well as implementation and savings verification plans



What to Expect: IGA role in the ESPC process

ESPC Process



- Heating
- Cooling
- Ventilation
- Controls
- Lighting (including Traffic Lights)
- Deferred Maintenance
- Renewables
- Water and Waste Water





What to Expect: Key IGA Components

- Utility Use Baseline
- Scope of Work
- Fixed Price
- Financing Plan
- Commissioning Plan
- Measurement & Verification Plan



- Use resources and get assistance
- Establish an internal team
- Develop a sound contract
- Be open to auditing all facilities
- Leverage funding sources
- Work with your ESCO





How to Ensure IGA Success: What Data to Evaluate?



BIG QUESTION:

*IN THE MULTITUDE OF WHAT IS
AVAILABLE, WHAT DATA NEEDS
EVALUATION AND HOW?*



Additional Data to Review during an IGA

- Building square footage
- Construction data for buildings and major additions, including building envelope
- Occupancy and usage information
- Energy-consuming/saving equipment already used on the premises (review large equipment specification sheets)
- Energy management procedures utilized on the premises
- Energy-related improvements already made or currently being implemented
- Changes in the structure of the facility or energy-using or water using equipment



Additional Data to Review during an IGA (continued)

- Future plans for building/equipment modifications and replacements
- Facility drawings and specifications
- Original construction submittals and factory data
- Operating engineer logs, maintenance work orders
- Records of maintenance expenditures on energy-using equipment, including service contracts
- Prior energy audits or studies
- Commissioning documents
- Computerized maintenance system records
- List of motors
- Recent combustion tests (e.g., for the boilers)



- Discuss facility operation
- Discuss comfort problems and requirements
- Discuss facility improvements
- Conduct equipment survey
- Measure all important parameters, collect data
- Log power loads
- Identify approach to hazardous materials (if any)

Energy Baseline

is the energy consumption that would have happened if all the existing equipment and systems were working, and normal service levels were maintained at the pre-project level of energy efficiency under the same demands (such as the weather).



IGA Results and Decision Items: Savings Opportunities

- Facilities description and status (discussed in previous slide)
 - Consider future plans for building use
 - Include a needs assessment from maintenance and occupants
- Baseline of energy consumption (discussed in previous slide)
 - Review and approve
 - Consider what-ifs
- Analysis of Each Proposed Measure
 - Review cost and savings estimates
 - Ensure the measurement and verification plan is viable for each measure



IGA Results and Decision Items: The Money

- **Firm Fixed Price**
 - Conduct a reasonableness test of itemized costs for each measure
 - Consider the elements in the overall price
- **Savings Estimates and Guarantee**
 - Consider the potential impact on the utility rate structure
 - Evaluate the proposed escalation rate and consider its impact
- **Financing Model**
 - Consider proposed financing and funding sources
 - Evaluate the payment plan over the financing term
 - Determine how to secure the financial provider
 - Consider all conditions, early payment options, penalties



IGA Results and Decision Items: Implementation Plans

- Commissioning Plan
 - Ensure the commissioning plan is sound
- Construction Plan
 - Consider what-ifs and how they'll be managed, including hazardous materials
- Measurement and Verification Plan
 - Assess the overall plan
 - Ensure it's a protocol that can be clearly applied and sustained



Potential IGA Shortcomings

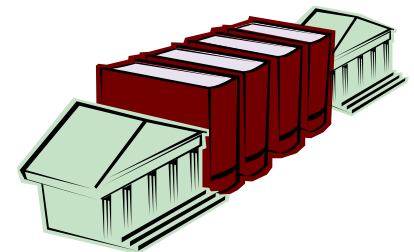
- Incomplete audit
- Pre-defined scope
- Unclear pricing
- Ineligible savings streams
- Lack of due diligence





IGA Report Expectations

- Realistic assumptions
- Completeness
- A clear guide to implementation
- A roadmap to any future energy efficiency retrofit work in the facility





Energy Services Performance Contracting: Investment Grade Audits

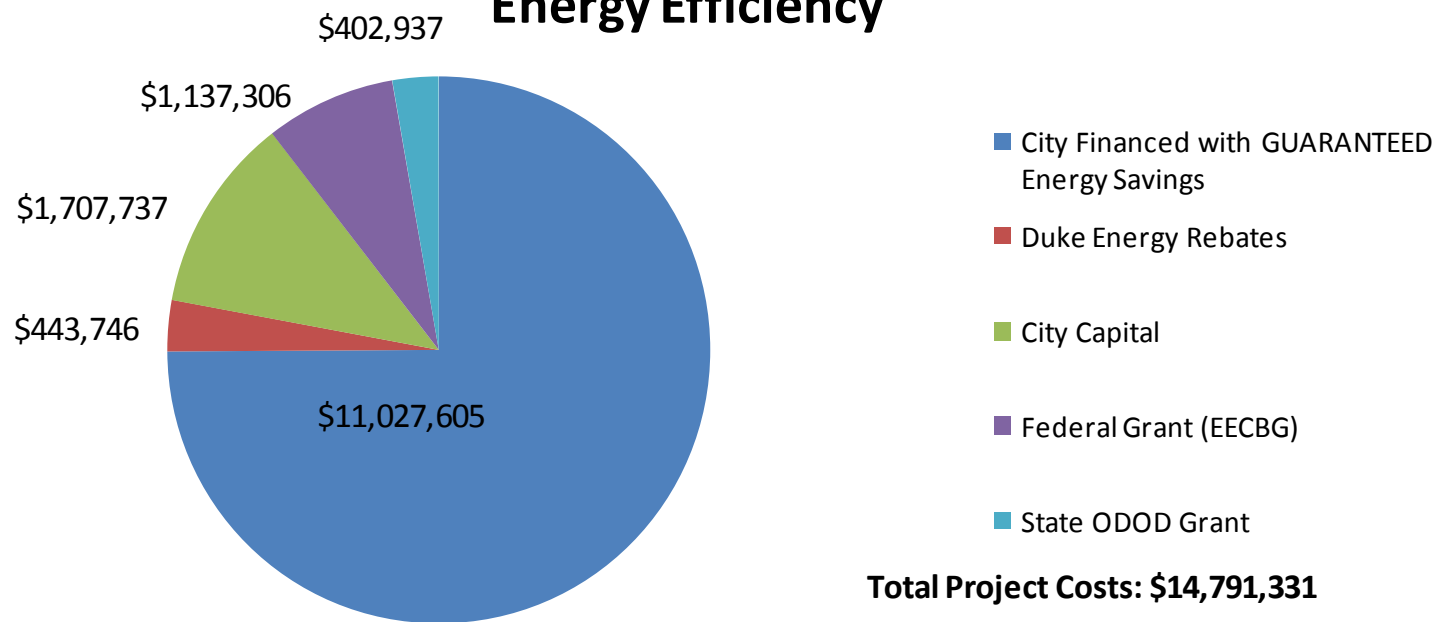
July 21, 2011



Cincinnati's ESPC Success

- \$14.7M - energy efficient upgrades in 69 of 400 bldgs.
- \$11M financed with energy savings, \$1.7M City Capital, \$1.1M EECBG, \$440K Duke Rebates, \$400K State Grant
- \$1M+ Guaranteed Annual Energy Savings.
- 10M kWh and 150K ccf reduction.
- Nearly 9K metric tons/year of GHGE Reduction

Leveraging of City Dollars to Reduce Costs/Increase Energy Efficiency



City of Cincinnati Energy Services Performance Contracts (2009 and 2010)

Dept./ Contractor	Total Project Costs	City Financed w/Energy Savings	City Capital	Duke Energy Rebates/ State Grants**	EECBG Funding	Guaranteed Annual Energy Savings	Energy Reduction (electric/gas)	Energy Generation	GHG Emission Reduction (metric tons/year)
2009 Energy Services Performance Contracting – Round #1									
Public Serv./ Ameresco	\$2,723,812	\$1,696,945	\$230,000	\$59,000/ \$402,937	\$334,930	\$153,761	1,552,865 kWh/ 11,703 ccf	100,000 kWh	1,331
Public Serv./ Honeywell	\$3,184,879	\$2,814,707	\$239,000	\$131,172	\$0	\$295,583	2,263,211 kWh/ 104,510 ccf	0	2,106
2009 Total	\$5,908,691	\$4,511,652	\$469,000	\$190,172/ \$402,937**	\$334,930	\$449,344	3,816,076 kWh/ 116,213 ccf	100,000 kWh	3,437
2010 Energy Services Performance Contracting – Round #2									
Health/ Ameresco	\$1,650,340	\$1,180,340	\$250,000	\$20,000	\$200,000	\$112,615	994,865 kWh/ 16,195 ccf	0	898
Lunken/ Ameresco	\$177,764	\$177,764	\$0	\$0	\$0	\$17,741	95,209 kWh/ 4,036 ccf	0	99
CRC E/ Ameresco	\$2,706,298	\$2,045,050	\$436,248	\$25,000	\$200,000	\$194,462	1,448,802 kWh/ 2,076 ccf	0	1,195
Total Ameresco	\$4,534,402	\$3,403,154	\$686,248	\$45,000	\$400,000	\$324,818	2,538,876 kWh/ 22,307 ccf	0	2,192
Parking/ Honeywell	\$1,605,947	\$1,455,996	\$0	\$149,951	\$0	\$115,232	2,163,467 kWh	0	1,877
CRC W/ Honeywell	\$2,670,291	\$1,656,803	\$552,489*	\$58,623	\$402,376	\$147,477	1,567,233 kWh/ 11,600 ccf	0	1,423
Total Honeywell	\$4,276,238	\$3,112,799	\$552,489	\$208,574	\$402,376	\$262,709	3,730,700 kWh/ 11,600 ccf	0	3,300
2010 Total	\$8,810,640	\$6,515,953	\$1,238,737	\$253,574	\$802,376	\$587,527	6,269,576 kWh/ 33,907 ccf	0	5,492
2009 and 2010 Energy Services Performance Contracting – Round #1 and #2									
2009/2010 Total	\$14,719,331	\$11,027,605	\$1,707,737	\$443,746/ \$402,937**	\$1,137,306	\$1,036,871	10,085,652 kWh/ 150,120 ccf	100,000 kWh	8,929



Facility Audits

- Contracts set up to allow for “free” audits with performance contracts.
- City Departments identify buildings for consideration obtain proposal, certify funds.
- Multiple meetings with facility mgmt. staff to discuss planned future use of building and maintenance issues.
- ESCO reviews energy bills and sets priorities based on energy reduction opportunities and maintenance needs.
- Decisions made about use of capital funds.
- Facility Managers have final say on selection of buildings, sub-contractors, and equipment to be used.

Facility	Address	Facility Square Feet	Annual Electric Dollars	Annual Gas Dollars	Electric \$/Sq. Ft.	Gas \$/Sq. Ft.	Total \$/Sq. Ft.
City Hall	801 Plumb Street	237,750	\$252,280	\$111,679	\$1.06	\$0.47	\$1.53
Centennial II	805 Central Avenue	213,000	\$370,179	\$0	\$1.74	\$0.00	\$1.74
Renaissance Building	316 W. 9th Street	17,500	\$1,775	\$8,312	\$0.10	\$0.47	\$0.58
Fire Station #02	18 Seymour Avenue	9,501	\$16,585	\$9,883	\$1.75	\$1.04	\$2.79
Fire Station #03	329 E. 9th Street	29,328	\$21,333	\$14,479	\$0.73	\$0.49	\$1.22
Fire Station #05	8 E. McMicken Avenue	17,100	\$6,480	\$11,301	\$0.38	\$0.66	\$1.04
Fire Station #07	2058 Sutton Avenue	4,951	\$4,977	\$7,930	\$1.01	\$1.60	\$2.61
Fire Station #08	5901 Montgomery Road	6,888	\$5,224	\$8,937	\$0.76	\$1.30	\$2.06
Fire Station #12	3001 Spring Grove Avenue	17,080	\$27,750	\$25,872	\$1.62	\$1.51	\$3.14
Fire Station #14	430 Central Avenue	35,757	\$31,066	\$13,292	\$0.87	\$0.37	\$1.24
Fire Station #17	2101 W. Eighth Street	20,160	\$12,188	\$12,021	\$0.60	\$0.60	\$1.20
Fire Station #18	478 Wilmer Avenue	18,357	\$21,045	\$19,038	\$1.15	\$1.04	\$2.18
Fire Station #19	2814 Vine Street	17,475	\$16,057	\$11,287	\$0.92	\$0.65	\$1.56
Fire Station #20	1668 Blue Rock Road	19,922	\$12,671	\$12,136	\$0.64	\$0.61	\$1.25
Fire Station #21	2131 State Avenue	10,161	\$11,715	\$7,757	\$1.15	\$0.76	\$1.92
Fire Station #23	1623 Madison Road	15,120	\$14,258	\$9,704	\$0.94	\$0.64	\$1.58
Fire Station #24	4526 Glenway Avenue	8,526	\$7,938	\$15,192	\$0.93	\$1.78	\$2.71
Fire Station #29	564 W. Liberty Street	18,752	\$17,362	\$8,917	\$0.93	\$0.48	\$1.40
Fire Station #31	4401 Marburg Avenue	12,000	\$15,388	\$12,295	\$1.28	\$1.02	\$2.31
Fire Station #32	650 Forest Avenue	22,033	\$19,596	\$12,740	\$0.89	\$0.58	\$1.47
Fire Station #34	301 Ludlow Avenue	10,701	\$7,603	\$8,165	\$0.71	\$0.76	\$1.47
Fire Station #35	3002 Junietta Avenue	6,850	\$5,628	\$7,320	\$0.82	\$1.07	\$1.89
Fire Station #37	310 Lilienthal Street	8,414	\$5,060	\$5,143	\$0.60	\$0.61	\$1.21
Fire Station #38	723 Circle Avenue	8,025	\$6,269	\$6,752	\$0.78	\$0.84	\$1.62
Fire Station #46	2731 Erie Avenue	10,950	\$12,199	\$7,694	\$1.11	\$0.70	\$1.82
Fire Station #49	5917 Prentice Street	4,150	\$4,246	\$5,572	\$1.02	\$1.34	\$2.37
Fire Station #50	6558 Parkland	6,350	\$5,098	\$4,041	\$0.80	\$0.64	\$1.44
Totals:		806,801	\$931,970	\$377,459	\$0.94	\$0.82	\$1.75
Total Gas and Electric Costs:				\$1,309,429			

You're not on your own!!!

- Access the U.S. DOE Solution Center:
<http://www1.eere.energy.gov/wip/solutioncenter/default.html>
- Consider an IGA contract template:
http://www.energyservicescoalition.org/resources/model/index.html#PreApproved_Contracts
- Get expert assistance:
 - Contact your state energy office where technical assistance may be available: <http://naseo.org/members/index.html>
 - Consider hiring a consultant to advise you
 - Learn from ESCOs – just ask!



Upcoming Webcasts

Please join us again:

Title: **Furthering Your Local Governments' Energy Efficiency Goals: Part 1 – Getting Support From Local Leaders**

Host: Katy Newhouse, ICF International; NASEO

Date: July 26, 2011

Time: 2:00 – 3:30 PM EDT

Title: **Exploring Power Purchase Agreements – The Basics Part 1**

Host: Paul Aldretti, Center for Climate Strategies; ICF International

Date: July 27, 2011

Time: 1:00 – 2:30 PM EDT

Title: **Introduction to using Community-Wide Behavior Change Programs to Increase Energy Efficiency**

Host: Sarah Busche, NREL

Date: July 28, 2011

Time: 3:00-4:15 PM EDT

For the most up-to-date information and registration links, please visit the Solution Center webcast page at www.wip.energy.gov/solutioncenter/webcasts

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Questions?