

Energy Efficiency and Conservation Block Grant (EE&CBG)

through the

United States Department of Energy (DOE)

under the

American Resource and Recovery Act (ARRA)



County of Orange, NY

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Preface

In 2009 the County of Orange was awarded an Energy Efficiency and Conservation Block Grant (EECBG) through the United States Department of Energy (DOE) under the American Resource and Recovery Act (ARRA). The objective of the \$3,516,700 Energy Efficiency and Conservation Block Grant is to reduce fossil fuel emissions; reduce total energy use of the eligible entities; improve energy efficiency in the building sector, the transportation sector, and other appropriate sectors; as well as creating jobs. The total award was divided into four project activities giving all County municipalities the opportunity to reduce its energy use.

1. Project Activity 1 – County Energy Audits
2. Project Activity 2 – County Building Energy Retrofits
3. Project Activity 3 – Municipal Partners Financial Incentives Grant Program
4. Project Activity 4 – Administration

I. Project Activity 1- County Energy Audits

Honeywell prepared an Investment Grade Energy Audit and proposed energy performance contracts detailing the proposed scope of work, measurement and verification costs, and guaranteed level of energy and operational savings. The following is a summary of the energy efficiency and infrastructure improvements identified for the 11 Orange County facilities included in this effort.

Full investment grade audits were conducted for the following buildings:

New Court Facility (Goshen)	128,910 sq. ft.
1841 Courthouse (101 Main St. Goshen)	13,087 sq. ft.
Valley View Nursing Facility (Goshen)	362,732 sq. ft.
Orange County Correctional Facility (Goshen)	448,043 sq. ft.
Dept. of Social Services (Quarry Rd. Goshen)	31,250 sq. ft.
911/Emergency Center (Goshen)	100,000 sq. ft.
DPW Administration Building (Goshen)	13,200 sq. ft.
Maple Building (Newburgh)	52,000 sq. ft.
1887 Building (124 Main St. Goshen)	21,060 sq. ft.

In addition, an energy use analysis of the Orange County Government Center was conducted. That analysis includes an energy use baseline, descriptions of the existing systems and conditions in the Center, and recommendations for energy efficient improvements.

Finally, a feasibility study for adding several renewable energy or energy efficient improvements to the Tower Building in Newburgh, in conjunction with the planned rehabilitation of that building was completed. The improvements considered are solar energy, wind power, and efficient solar window film.

All audits were completed without required leverage for a cost of \$202,750 (100% grant funded). The feasibility study of these county facilities identified a wide range of energy efficiency and renewable energy potential improvements, as identified in the Energy Audit Project Activity sheet (see page 4). Types of energy efficiency metrics evaluated included HVAC systems, major mechanical equipment, lighting systems, building envelopes, and renewable energy opportunities. In total, approximately \$9.7 million in infrastructure improvements resulting in nearly \$700,000 in annual operational cost reduction were identified. The identified projects also include over \$1.3 million of projects contained in the County's current Capital Plan.

Honeywell identified several primary needs during the examination of County facilities: reduce operating costs; modernize building systems, replace aging equipment, and build an infrastructure to support future growth; assist in developing and implementing a plan for use of EECBG funds; and increase utilization of renewable energy. Specifically, Honeywell identified energy efficiency measures which in total would:

- Address over \$12 million in infrastructure needs.
- Generate approximately \$700,000 in annual energy and operational savings
- Reduce greenhouse gas emissions by 2,126 tons of CO2 per year
- Utilize renewable energy sources such as solar energy.
- Reduce operational costs and future capital outlay needs.
- Provide a means for installing needed capital upgrades, such as HVAC systems, improvements to building envelopes, and a next generation County-wide building automation system linking all buildings to a single means for monitoring and managing the facilities.

Building	PM & Engineering	Building Envelope / Insulation	Lighting Upgrades	Solar Window Film	HVAC Mechanical Upgrades	Pipe Insulation	Direct Digital Controls	Energy Efficient Motors and/or Drives	Water Efficiency Measures	Renewable Measures: Solar w/ New Roof	Subtotal By Building
1887 Building	\$ 1,569	\$ 93,438	\$ 25,513		\$ 619,225	\$ 21,584	\$ 381,901		\$ 9,140		\$ 1,126,758
Savings Payback	\$ 143	\$ 110	\$ 37		\$ 103.6	\$ 52	\$ 5155		\$ 433		\$ 41,342
New Court House	\$ 9,742	\$ 294,528	\$ 27,514		\$ 1,745	\$ 1,975	\$ 60,984	\$ 232,648			\$ 633,732
Savings Payback	\$ 766	\$ 127	\$ 107		\$ 181	\$ 181	\$ 16,222	\$ 7,712			\$ 55,934
Orange County Correctional Facility	\$ 20,593	\$ 1,025,113	\$ 110,400		\$ 368,487	\$ 66,547	\$ 147,869	\$ 414,094	\$ 86,453		\$ 2,129,157
Savings Payback	\$ 1,799	\$ 114	\$ 93		\$ 39,070	\$ 5,470	\$ 17,040	\$ 14,600	\$ 20,597		\$ 208,974
Valley View Nursing Home	\$ 39,858	\$ 994,824	\$ 93,398	\$ 134,685	\$ 617,106	\$ 191,442	\$ 111,442	\$ 282,840	\$ 250,144		\$ 2,622,357
Savings Payback	\$ 4,031	\$ 99	\$ 107	\$ 123,312	\$ 21,779	\$ 18,446	\$ 5,179	\$ 14,479	\$ 23,475		\$ 493,099
DSS Quarry Rd	\$ 19,533	\$ 269,340	\$ 38,204	\$ 10,977	\$ 664,742	\$ 15,500	\$ 194,688		\$ 303		\$ 1,205,082
Savings Payback	\$ 2,251	\$ 87	\$ 71	\$ 888	\$ 16,250	\$ 178	\$ 9,243		\$ 616		\$ 67,630
1841 Building	\$ 2,197	\$ 38,929	\$ 5,887	\$ 11,215	\$ 488,707	\$ 45,315	\$ 68,772		\$ 3,222		\$ 947,048
Savings Payback	\$ 200	\$ 110	\$ 66	\$ 77	\$ 152.9	\$ 7.2			\$ 290		\$ 17,323
Maple Building, Newburgh	\$ 344,263	\$ 266,305	\$ 37,866	\$ 52,897	\$ 3,195		\$ 165,588	\$ 93,798	\$ 24,216		\$ 658,358
Savings Payback	\$ 7,557	\$ 45.6	\$ 7.0	\$ 16.1			\$ 1,893	\$ 1,849	\$ 13.1		\$ 52,449
Tower Building (Community College)				\$ 67,852							\$ 67,852
Savings Payback				\$ 4,227							\$ 4,227
Emergency Services 911 Bldg	\$ 4,707	\$ 446		\$ 575,360	\$ 23,745		\$ 55,129		\$ 87		\$ 635,283
Savings Payback	\$ 446	\$ 10.6		\$ 24.2	\$ 83		\$ 6,687		\$ 187		\$ 31,047
DPW Administration Building	\$ 1,569	\$ 51,331	\$ 9,066	\$ 7,378	\$ 720,353		\$ 230,579		\$ 6,718	\$ 587,484	\$ 1,605,414
Savings Payback	\$ 143	\$ 110	\$ 5.6	\$ 704	\$ 2,850		\$ 1,993		\$ 442	\$ 21,129	\$ 36,356
Price Savings	\$ 1,049,673	\$ 448,854	\$ 3,033,809	\$ 203,651	\$ 4,083,980	\$ 376,639	\$ 1,416,913	\$ 1,023,380	\$ 380,184	\$ 587,484	\$ 12,694,568
Energy Savings	\$ 17,334	\$ 347,877	\$ 22,881	\$ 114,615	\$ 36,485	\$ 61,499	\$ 38,673	\$ 47,888	\$ 21,129	\$ 44,415	\$ 708,381
NYSERDA/Utility Rebates											\$ 328,847
Simple Payback	25.89	8.05	12.83	35.45	10.32	23.04	25.65	7.94	25.70		17.46
Impact of EECB Funds	EECBG Funds = \$3,001,700	\$2,714,000	Net Cost = \$ 9,960,568	Payback = 13.63							



Energy Audit Project Activity Sheet

II. Project Activity 2- County Building Energy Retrofits

The use of grant funds matched one to one with county funds under an energy performance contract allowed the county to move forward on certain recommendations made by Honeywell in the Energy Audit conducted in Project Activity 1. The buildings receiving upgrades included the DPW Administration Building, Orange County Correctional Facility, new court facility, 1841 Court House (all in Goshen) and the Maple Building in Newburgh.

The types of upgrades included:

- Roof upgrades – insulation, replacement & photovoltaic installation on DPW Administration Building
- Building envelop & insulation
- Lighting
- Solar window film
- HVAC/mechanical upgrades
- Boiler controls
- Load curtailment hardware and strategies

The EECBG and the County each provided 50% (\$2,066,205) of the total cost of \$4,132,410. Retrofits at both the DPW Administration Building and the 1841 Courthouse are completed.



Photovoltaic installation at Orange County Department of Public Works

Honeywell proposed a cost-effective plan for Measurement and Verification (M&V) to ensure that the guaranteed savings are realized and that all US DOE monitoring requirements are met. Their proposed approach strikes a balance between the cost of M&V and the level of information required to substantiate our savings guarantee and performance. The County and Honeywell have agreed to a plan which will satisfy DOE's expectations and provide assurance to the County that the expected results are being realized. Honeywell will be responsible for taking measurements of the current energy efficiency of equipment scheduled for replacement and will then measure performance of the new equipment. These measurements will take place during the construction phase and after the new equipment is in place. Honeywell will advise the County on the activities and equipment the County will need in order to continue monitoring in-house.

Prior to construction, Honeywell established baseline efficiencies and operational parameters. Parameters that are beyond Honeywell's control, such as operating hours, energy rates, and others, will be agreed upon between Honeywell and Orange County. After construction is completed, Honeywell will conduct post-installation measurements in accordance with the M&V Plan. Actual savings will then be determined from the baseline measurements, post-installation measurements, and agreed-upon stipulated parameters. In the event that actual savings are less than the guaranteed savings, Honeywell will take steps to identify and implement, at its cost, the necessary improvements to generate sufficient savings, or pay Orange County the difference between the actual and guaranteed savings.

Energy Conservation Measure	Proposed (Guaranteed) Savings	Cost Avoidance			Excess Savings
		Install Period	Guar. Year 1	Total Savings	
Lighting Upgrades	\$180,426	\$161,175	\$219,090	\$380,265	\$199,839
HVAC Mechanical Upgrades	\$ 38,429	\$ 3,202	\$ 38,429	\$ 41,631	\$ 3,202
Water Efficiency Measures	\$ 22,372	\$ 15,446	\$ 20,880	\$ 36,326	\$ 13,954
Building Envelope	\$ 8,129	\$ 1,004	\$ 8,129	\$ 9,133	\$ 1,004
Solar Window Film	\$ 5,341	\$ 3,111	\$ 5,341	\$ 8,452	\$ 3,111
Renewable Meas-Solar w/ New Roof	\$ 4,376	\$ 365	\$ 4,376	\$ 4,741	\$ 365
Pipe Insulation	\$ 5,470	\$ 4,103	\$ 5,470	\$ 9,573	\$ 4,103
	\$264,543	\$188,406	\$301,715	\$490,121	\$225,578



Orange County, NY
Honeywell Guaranteed Energy Services Agreement/Change Order #1
Preliminary Energy Cost Avoidance Calculation
Installation Period and Guarantee Year 1

This table demonstrates the County's efforts met and surpassed expectations.

III. Project Activity 3- Municipal Partners Financial Incentives Grant Programs

The County initiated three rounds of an incentive financing program by providing competitive, matching grants to its partner municipalities and school districts. Grants in Rounds 1 & 2 were offered:

- 1) to support energy audits,
- 2) to support workforce training and public education efforts to achieve the goals set forth in the county energy strategy, and
- 3) for technical assistance to help partners gain access to professional services needed to complete their own energy efficiency strategies.

In support of energy audits, the Orange County program served to assist municipalities in allocating required matching funds needed to participate in the NYSERDA programs. Orange County will coordinate its incentive program with the programs implemented by the New York State Energy Research and development Authority (NYSERDA), in order to avoid duplication of effort in technical analysis and project approvals.

Round 3 was open only to municipalities and provided grants for the implementation of retrofitting activities in publicly owned facilities, where municipalities had previously obtained an energy audit. The type of retrofitting activities funded under round 3 of this municipal grant included lighting, HVAC system upgrades, window replacements, and heating, ventilation and air conditioning system upgrades. For renewable energy measures, the Town of Warwick installed a solar hot water system, the Village of Warwick installed solar lighting, and the Village of Monroe a roof mounted solar electric system.

Vendor/Subgrantee	Funding Source/Project Description	Award
Honeywell	EECBG-Energy Audit County Bldgs.	\$202,750.00
Honeywell	EECBG - Guaranteed Energy Services Agreement	\$4,147,211.00
Honeywell	EECBG Year 1 M&V payment	\$30,544.00
Village of Goshen	EECBG - Round 1 - energy audit	\$400.00
Village of Goshen	EECBG - Round 1 - feasibility analysis, design and cost estimate of current Wastewater Treatment Facility to assess potential for installation of solar panels	\$5,760.00
Town of Minisink	EECBG - Round 1 - energy audit	\$700.00
Town of Walkill	EECBG - Round 1 - energy audit	\$30,000.00
Town of Cornwall	EECBG - Round 1 - energy audit	\$400.00
Town of New Windsor	EECBG - Round 1 - energy audit	\$5,500.00
City of Middletown	EECBG - Round 1 - consultant services to evaluate the existing heating, ventilation and air conditioning system at City Hall and design of new HVAC system	\$29,100.00
Warwick Valley CSD	EECBG - Round 1 - \$65,000 to school district for training and engineering and \$35,000 to school district partners for municipal elements of PACE initiative	\$100,000.00
Orange-Ulster BOCES	EECBG - Round 1 - energy conservation study	\$9,600.00
Newburgh Enlarged CSD	EECBG - Round 1 - Underwrite year 2 of professional consultant services with Energy Education, Inc. in support of the development, implementation and management of the district's Energy Education Program	\$87,000.00

Middletown Enlarged CSD	EECBG - Round 1 - secure a NYSERDA qualified technical services provider with FlexTech assistance, to conduct building energy studies, modeling and commissioning for the newly constructed elementary school.	\$57,890.00
Pine Bush CSD	EECBG - Round 1 - funds to support student energy conservation and education program expenses associated with Pine Bush Summer Science Academy	\$4,650.00
Middletown Enlarged CSD	EECBG - Round 2 - NYSERDA FlexTech energy audit of all Middletown City School District boilers and hot water heaters.	\$5,000.00
OC Community College	EECBG - Round 2 - local cost of NYSERDA FlexTech energy audit for eleven primary buildings on the OCCC Middletown campus.	\$4,400.00
Town of Wallkill	EECBG - Round 2 - local cost of NYSERDA FlexTech energy audit for Town Community Center, Highway Garage and Sewer Dept. facilities.	\$25,000.00
Village of Monroe	EECBG - Round 3 - roof mounted solar pv system for Water Plant	\$38,050.00
Village of Monroe	EECBG - Round 3 - local cost of Orange & Rockland energy audit for Village Police Department, Garage , Village Hall and Water Department	\$3,050.00
Town of Crawford	EECBG - Round 3 - boiler replacements, programmable thermostats, lighting controls, lighting upgrades in Government Center based on NYSERDA audit	\$39,161.00
Village of Walden	EECBG - Round 3 - replacement of lighting and windows	\$37,770.00
Town of Warwick	EECBG - Round 3 - replacement of lighting and windows, install Solar Hot Water Heater	\$49,810.00
Village of Warwick	EECBG - Round 3 - installed insulation in Village Hall and LED lamp pole fixtures - 3 solar powered	\$38,000.00
Town of Monroe	EECBG - Round 3 - Lighting retrofits in 6 municipal bldgs.	\$8,353.48
City of Middletown	EECBG - Round 3 - replacement of existing lighting in eleven buildings owned and operated by the City	\$64,722.74
Town of Wallkill	EECBG - Round 3 - Rooftop HVAC Unit Replacement	\$115,400.00
City of Port Jervis	EECBG - Round 3 - Window and door replacements	\$28,300.00
Town of Newburgh	EECBG - Round 3 - energy retrofits-installation of a solar array and installation of high efficiency induction lighting	\$52,000.00
Town of New Windsor	EECBG - Round 3 - Window and Rooftop HVAC Unit Replacement	\$65,000.00
Town of Deerpark	EECBG - Round 3 - window and door replacements Town Hall	\$52,000.00
Village of Tuxedo Park	EECBG- Round 3- Installation of new wash down control panel and piping into screen room-Waste Water Treatment Plant Influent Screen Bldg.	\$4,800.00
Village of Tuxedo Park	EECBG - Round 3 - Lighting retrofits in 4 municipal bldgs.	\$1,499.00
Town of Chester	EECBG - Round 3 - energy retrofits-Boiler modifications, door replacements.	\$36,027.00
Town of Cornwall	EECBG - Round 3 - energy retrofits, rooftop AC replacement	\$10,500.00
Administrative Activity	EECBG-Personnel, office supply, travel	\$104,081.37
		\$5,523,429.59
		\$2,073,605.50
Total Obligated		\$3,449,824.09

*
\$4,147,211.00
contract = 1:1
County/EECBG
Funds

Fully completed, the total project cost was \$1,788,275. Sixty percent was grant funded while forty percent derived from local cost share. \$1,088,275 (or \$1,096,567) of grant funds used leveraging of approximately \$700,000 in municipal cash and in-kind services. 34 contracts were executed and 39 separate buildings were included in this energy improvements contract work. \$175,000 in unused funds remain due to cancelled contracts and work completed under budget.

To utilize the remaining EECBG dollars, Orange County will use its remaining federal stimulus dollars to leverage county dollars and other non-federal funding sources to help residential property owners make energy efficient renovations and investments in renewable energy that can significantly lower their energy bills. Orange County will partner with Northern Westchester Energy Action Consortium (NWEAC) to create a Property Assessed Clean Energy (PACE) program.

PACE is a mechanism for financing energy efficiency building renovations and small scale renewable energy systems. Property owners who opt to use a PACE program to finance these projects agree to an incremental charge on their property taxes over an extended term of 20 years. No upfront costs are incurred by the property owner and property owners' annual energy savings typically exceed the annual additional property tax assessment charge. When a homeowner moves or the property is transferred, the new owner picks up the payments and the savings, where the previous owner left off.



Village of Warwick photovoltaic street light

IV. Project Activity 4- Administration

The grant balance remaining (approximately \$160,000) is administrative reimbursement dollars to offset the County Departments of Public Works, Planning and Grants' staff time utilized to implement the grant. It primarily was used to reimburse the county for personnel/fringe expenses for staff working on the grant. An average of 2,644 hours was spent working on these projects over the course of three years. Approximately \$104,000 of the original budget of \$160,000 was actually used. The rest was shifted back into the municipal project activity.