

Building Audits: The Red Hook Experience

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Energy Leadership

- Completed Greenhouse Gas (GHG) Inventory
- Drafting Climate Action Plan
- 10% Challenge
- Supporting State's 80x50 Goal
- Strength in Numbers (CSC and ICLEI)
- Town Hall Energy Audit and Energy Efficiency
- Solar Panels Installations
- ENERGY STAR Building Code Requirements
- Sustainable and Energy Efficient Land Use Commitments

Overview

- First Steps
- Audit/Results
- Next Steps
- Lessons Learned
- Benefits

First Steps

- Courtney Strong, Inc.
- Motivated Conservation Advisory Council (CAC)
 - First step towards addressing GHG emissions
 - Laurie Husted – CAC member and Bard College Sustainability Coordinator
- Completed simple form, sent it to NYSERDA and were contacted by auditor

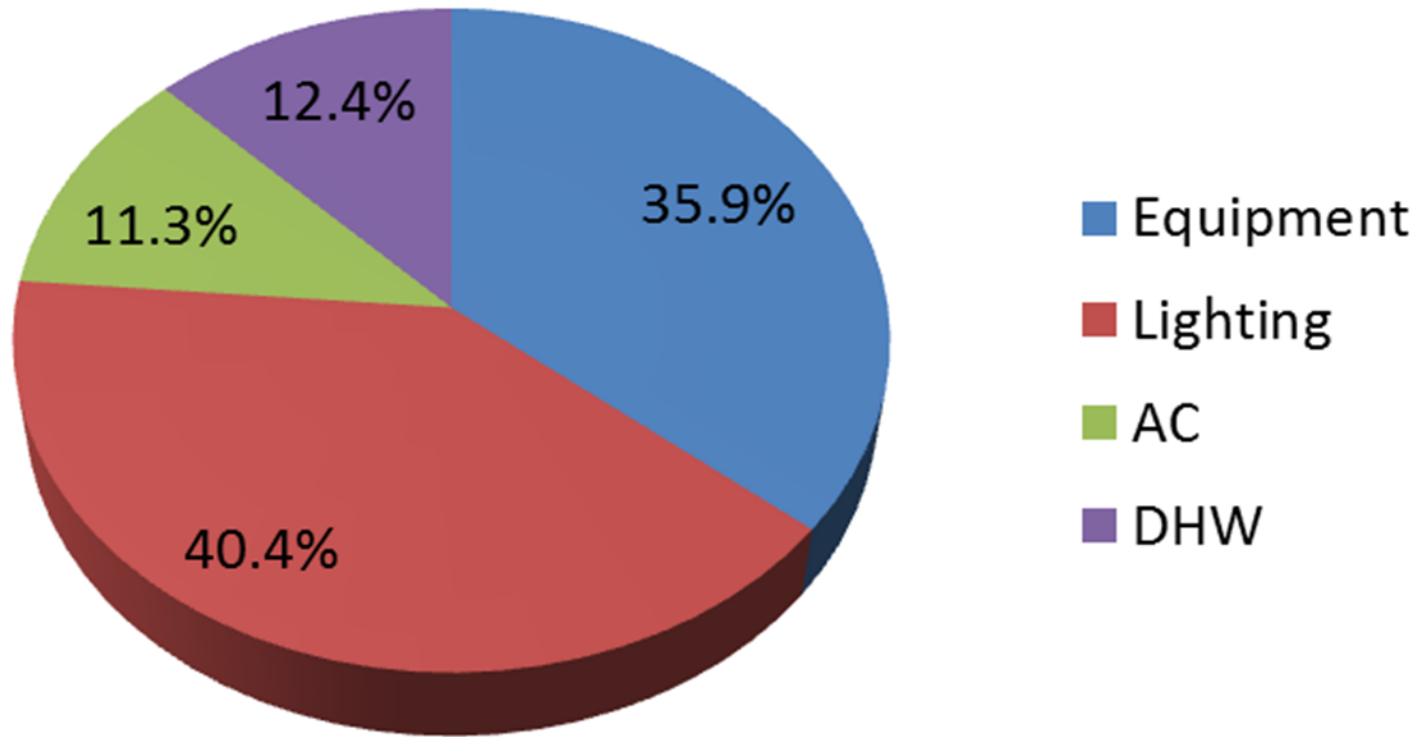
The Audit

- September 2005
- Included:
 - **Lights** – Replacements for older inefficient lighting
 - **Controls** – Improved or added controls for lighting, heating, and hot water to reduce costs
 - **Conservation measures** – Increased or new insulation, weatherproofing seals, and weatherstripping
 - **HVAC, DHW, and Custom measures** (depending on the existing structure), such as upgrading windows, insulation, motors, freezer or refrigeration doors/cases, and other equipment

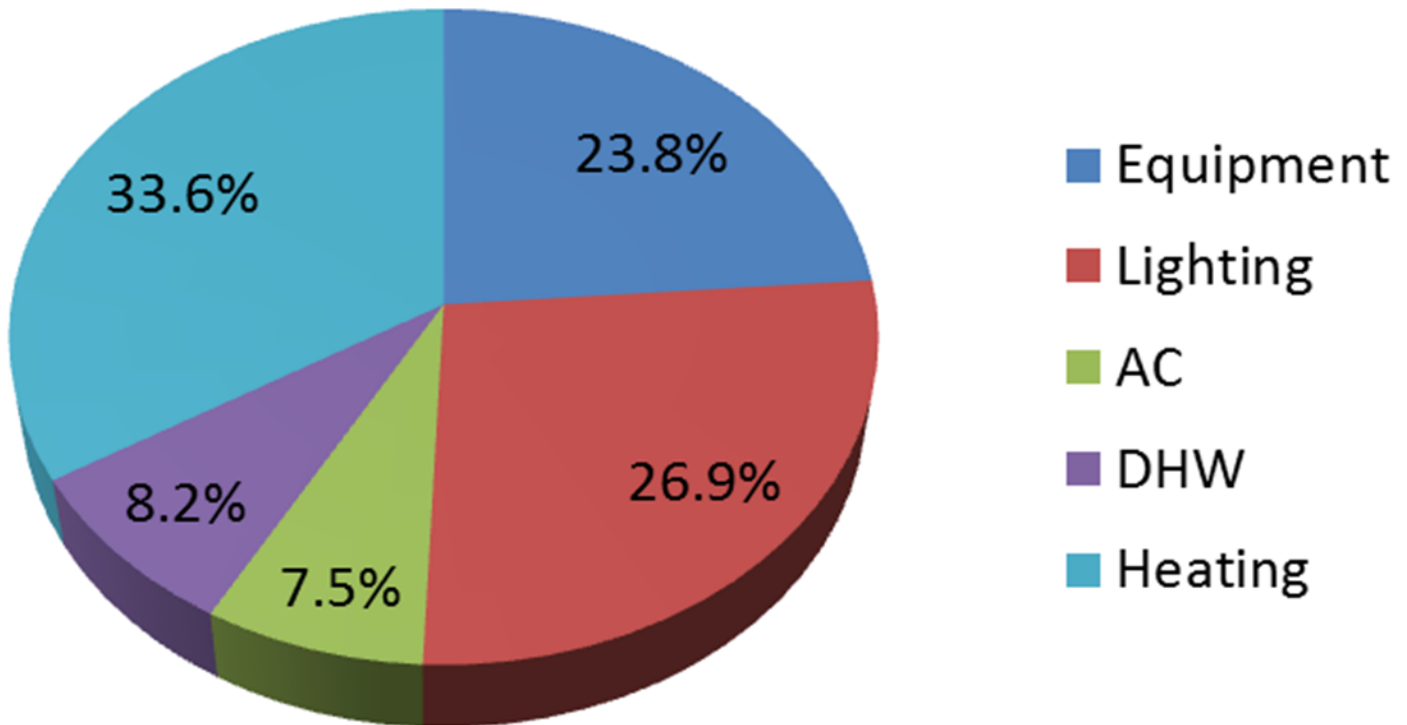
Results in Energy Audit Report

- Four recommendations, known as Energy Conservation Measures, or ECMs
 - Lighting (~300 bulbs and 80 fixtures)
 - Programmable thermostat
 - Weatherstripping
 - Occupancy sensors
- Annual energy usage information
- NYSERDA rebates and incentives
- Ten Year Cashflow Projection, including financing and loan options

Red Hook Town Hall: Annual Electricity Consumption



Red Hook Town Hall: Annual Energy Cost



ECMs and Avoided Emissions

Energy Conservation Measure (ECM)	Annual Savings	kWh Savings	Payback Years	Project Cost
Upgrade T-12 Fluorescent Lighting with New T-8 Lamps and Ballasts	\$812	5,628	5.5	\$4,470
Install Occupancy Sensors	\$120	1,024	1.4	\$165
Install Programmable Thermostat	\$86	0	2	\$175
Weatherstrip Door	\$71	0	0.9	\$65
<i>Totals</i>	<i>\$1,089</i>	<i>6,652</i>		<i>\$4,875</i>

Fuel Type	NO _x (lbs)	SO ₂ (lbs)	CO ₂ (lbs)
Electricity	8.6	20.1	5,867.10
Oil	17.4	3.5	177.3
<i>Totals</i>	<i>26</i>	<i>23.6</i>	<i>6,044.40</i>

Next Steps

- CAC worked with Purchasing Agent and Building Manager
- Formal bidding (late 2006 - 2007)
- Town Board approves lighting expenditures (2007)
- Thermostats installed (2007)
- Lighting completed (2008)

Lessons Learned

- Cost overruns
 - Ask questions and be prepared for higher costs
- Know what will be included in audit
- Leadership and follow-through
 - Designate responsible party and keep them informed
 - First major energy initiative, so it took than expected
 - Responsible party must keep moving forward
- Measuring savings
 - Establish process early on for tracking progress
 - Red Hook cannot clearly assess savings attributable to ECMs

Lessons Learned: Financial

- Cost estimates based on contractor estimating guides
- Lighting
 - Estimated cost: \$4,470
 - Bid: \$10,900
 - **Actual cost: \$6,630**
- Thermostat
 - Estimated cost: \$175 (1 thermostat + labor, etc.)
 - **Actual cost: \$885** (2 thermostats + labor, etc.)

Lessons Learned: Responsibility

- Work with Town Purchasing Agent
 - Decision to not install occupancy sensors
 - Weatherstripping not installed
 - Did not receive all rebates
- Driven by volunteers
 - Time commitment
 - Authority
- Must identify responsible party
- Good communication

Benefits

- Launched subsequent energy and GHG reduction initiatives
- Saved money and reduced emissions
 - 2005: 62,374kWh
 - 2007: 51,402kWh
 - 2009: 48,675kWh
- Town/CAC set example and became resource for community
- Town Hall staff became more aware of energy use and costs
- Continuing discussions on ways to improve

Benefits: PV Demo

- NYSERDA offered photovoltaic (PV) demo grants
- Eligibility required implementing ECMs
- Received grant for demo
- Upgraded to full-scale PV in June 2011

Thank you!

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