

Municipal Energy Efficiency



PRESENTED BY:

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Practical Energy Solutions



A six year old energy consulting company focused on energy assessments, strategic planning, and conservation & efficiency programs to assist in meeting short and long term energy goals

- Energy audits/assessments
- Financial and technical evaluation of capital projects
- Building operational review and conservation strategies
- Energy education & awareness programs
- Feasibility studies
- Carbon footprint analysis
- LEED/Green Building certifications
- Grant writing and implementation
- Measurement and verification of savings from energy upgrades and initiatives

Practical Energy Client List

Municipal Clients:

City of Philadelphia
Chester County
Delaware County
Borough of West Chester
Media Borough
Tredyffrin Township
Plymouth Township
City of Coatesville

Institutional Clients:

West Chester Area School District
Chester County Intermediate Unit
Westtown School
Downingtown Area School District
The Hill School
Overbrook School for the Blind
Pottsgrove School District
Arthur Ashe Youth Tennis Center
William Penn School District
Devereux Foundation/School
People's Light & Theater Company
Upper Merion Area School District

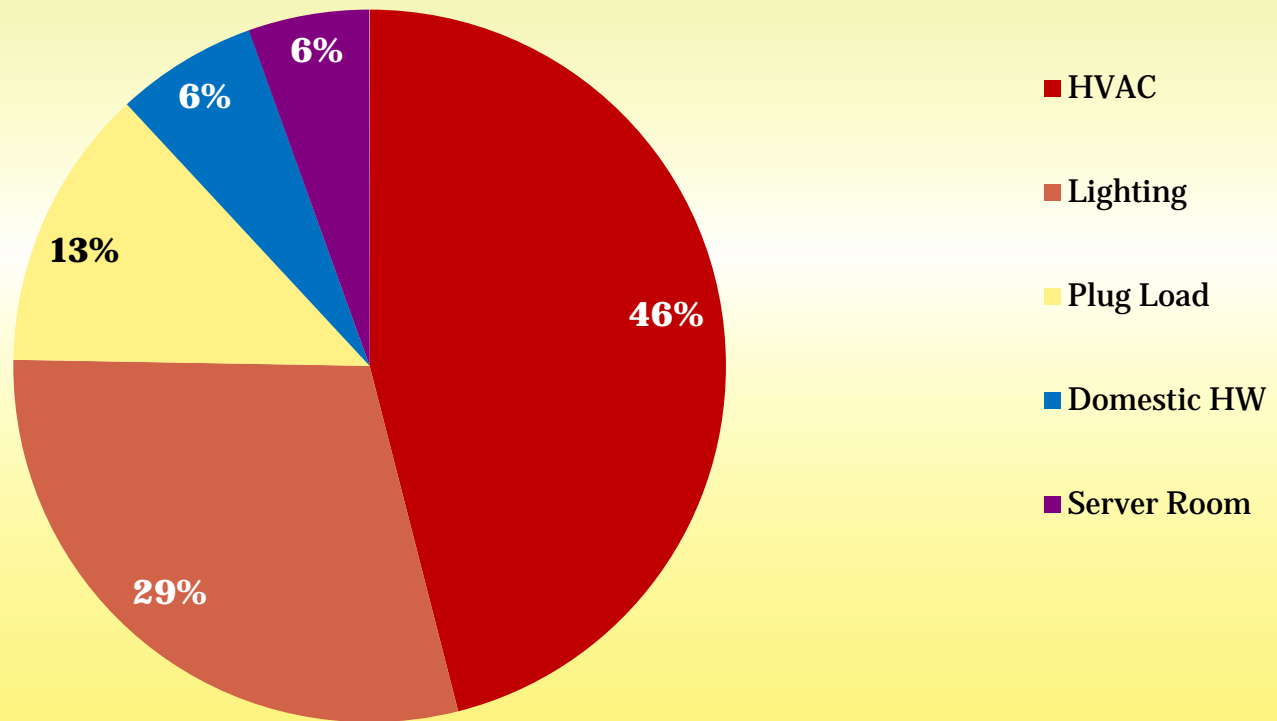
Commercial/Industrial Clients:

Vertex, Inc.
Ballard Spahr
Accu-Weld
Bentley Systems
Sikorsky Helicopter
Chester County Economic Development Council
ING Insurance
Devault Foods

Typical Office Building Energy Use

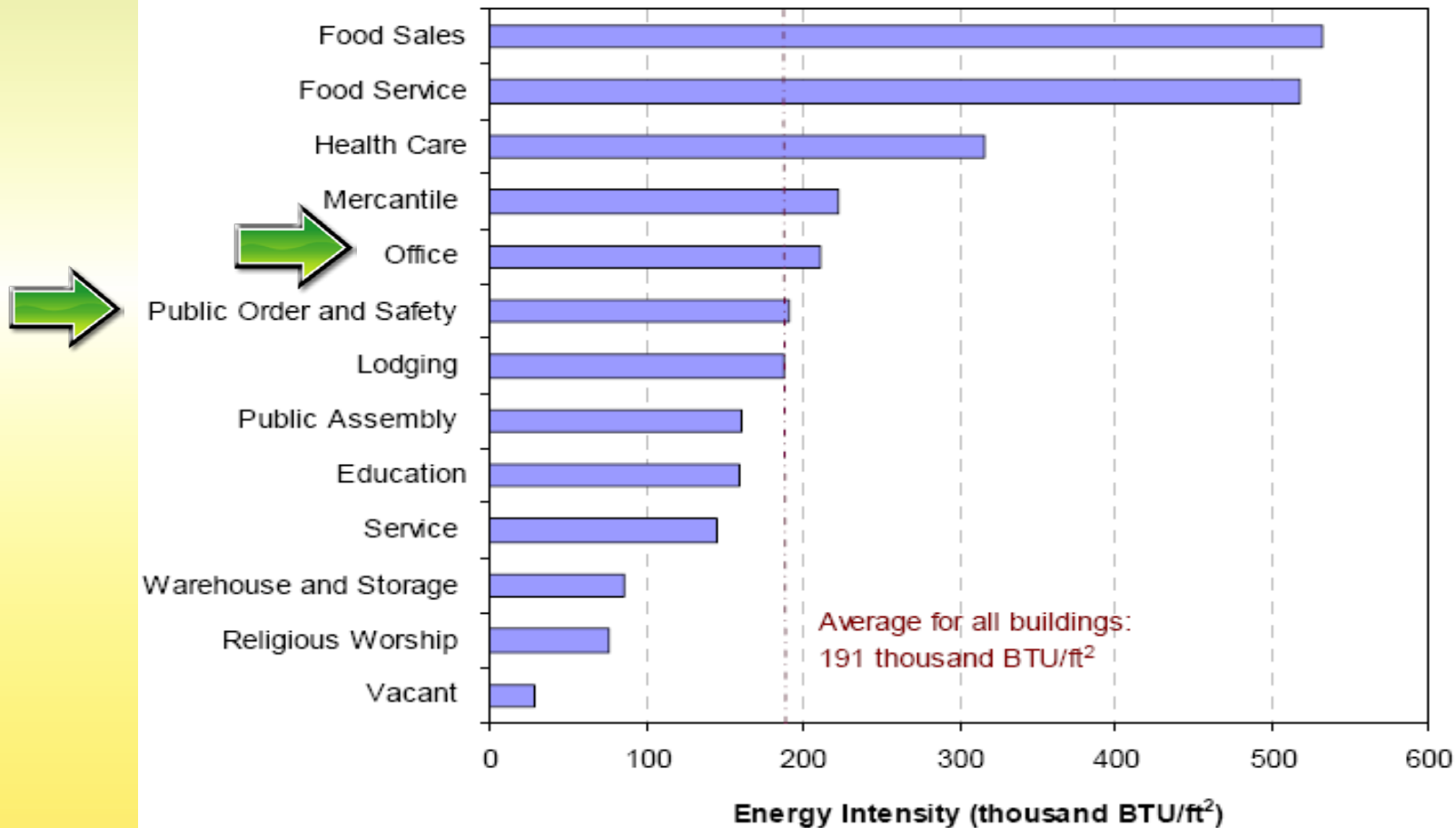


Building Energy Usage



Commercial Building Energy Use

Primary Energy Intensity for U.S. Commercial Buildings (2003)²



Municipal Programs



- **Chester County Municipal Energy Audit Program**
 - Energy audits for all municipalities that applied
 - ✦ Admin Buildings
 - ✦ Police Stations
 - ✦ Sewage Treatment Plants
 - ✦ Pump Stations
 - ✦ Firehouses
 - ✦ Libraries
 - ✦ Public Works Garages
 - Provide recommendations for operations (plug load and system management) and capital upgrades



- **Delaware County Energy and Environmental Plan and Action Strategy**
 - **Assessment and Strategy for County Operations**
 - ✦ **Compile existing data**
 - ✦ **Operational strategies & policies**
 - ✦ **Capital upgrades**
 - ✦ **Fleet management**
 - ✦ **Awareness**
 - **Assessment and Strategy for Municipalities**
 - ✦ **Sample Community Data Review**
 - ✦ **Model ordinances**
 - ✦ **Energy Strategies and policies**

Municipal Programs



- **Delaware County Energy Efficiency Grant Program**
 - **Prescriptive Program**
 - ✦ Free assessments and technical support for 40 eligible municipalities
 - ✦ Rebates/grants for energy related projects

Starting an Energy Initiative



Starting an Energy Initiative



- **First step – baseline assessment (benchmark & goals)**
- **Second – implement conservation strategies, and operational and policy-driven best practices**
- **Next - implement efficiency upgrades**
- **Look at renewable energy projects**
- **Track your energy consumption and report your reductions!**

Energy Conservation



CONSERVATION + EFFICIENCY = REAL PROGRESS!

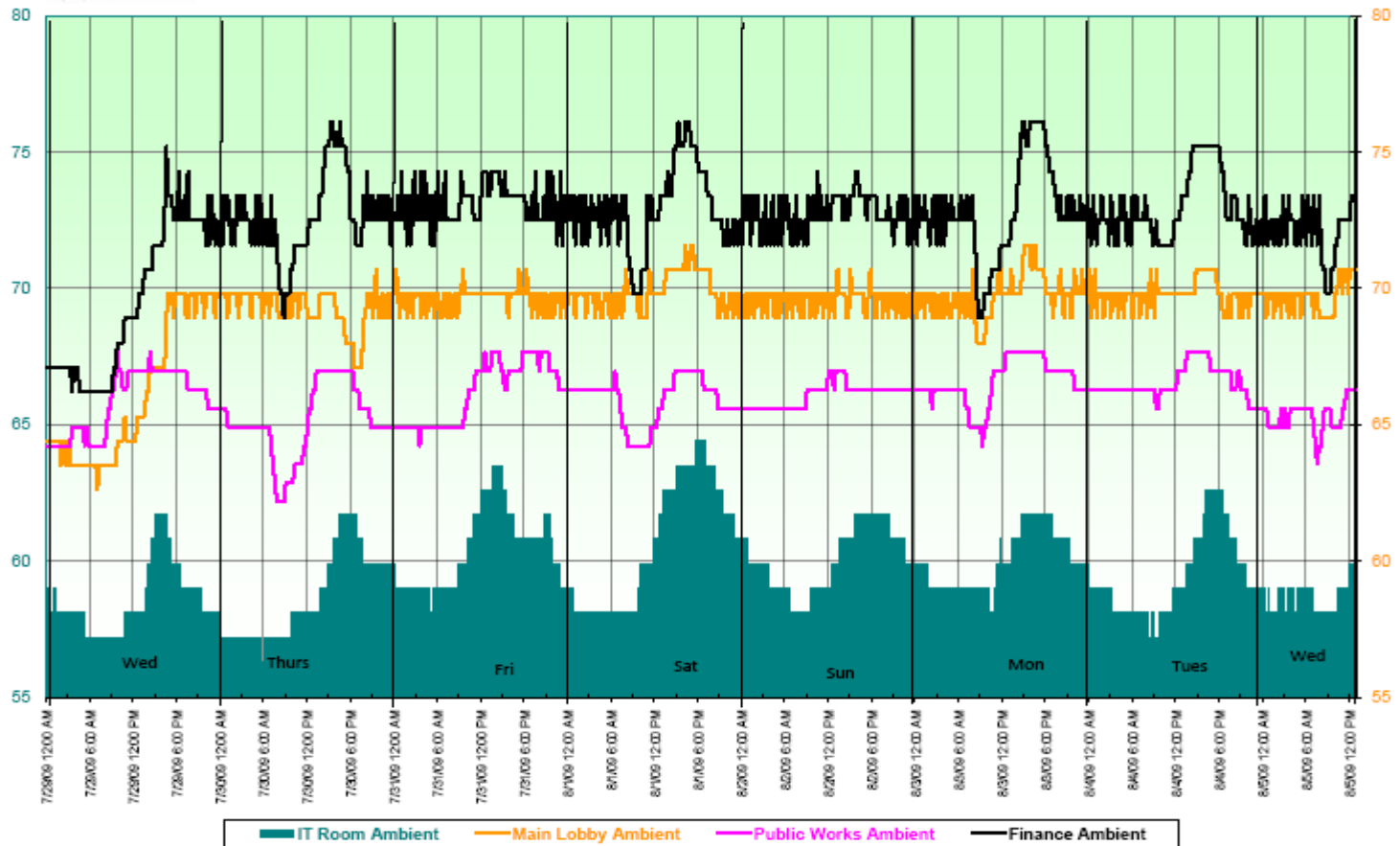
Hummer @ 8 mpg, 5,000 miles/year = 626 gallons of gas
Prius @ 45 mpg, 30,000 miles/year = 667 gallons of gas

Conservation Strategies



- **Conservation**
 - Education of Occupants
 - ✦ In-person training and motivational programs
 - Education of maintenance staff
 - Management of systems

Case Studies – Controls



Case Studies – Conservation



Tredyffrin Twp	April 2012	Since May 2010
<u>Cost Savings:</u>		
Conservation	\$ 747.65	\$21,379.21
Electric Rate Change	<u>\$1,798.89</u>	<u>\$29,714.25</u>
Total	\$2,546.54	\$51,093.47 33.5%
<u>Electricity Savings</u>	5,952 kWh 13.1%	207,360 kWh 16.3%
<u>CO₂ Emissions Reductions</u>	7,499 lbs 13.1%	261,271 lbs 16.3%



WC Borough - November 2010	November 2010: Actual vs. Projected	Last 23 Months: Actual vs. Projected
Dollar Savings	\$1,660*	\$48,052
Percent Savings	31.8%	29.9%
kWh Savings	3,553 kWh	104,407 kWh
Percent Savings	9.5%	9.3%
CO₂ Emissions Reduction (lbs)	4,477 lbs	131,553 lbs**
CO₂ Emissions Reduction (%)	9.5%	9.3%

Primary Capital Investments



- **Lighting**
- **Building Envelope**
- **Office Equipment Upgrades**
- **Heating and Air Conditioning**

Lighting

- Lighting retrofits can be the most cost-effective capital improvement with the shortest payback period – usually 5 years or less.
- Primary ways to save: reduce amount of energy used when lights are on, and reduce the amount of time lights are on
- Occupancy sensors are perfect for common areas that include restrooms, conference rooms, and supply and copier areas

Type of Space	Range of energy savings from sensors (%)
Private office	13 - 50
Open-plan office	20 - 28
Classroom	40 - 46
Conference room	22 - 65
Corridors	30 - 80
Storage areas, closets	45 - 80

Building Envelope



- **Insulation: walls, floor, and ceiling or roof**
 - Heat moves through each of these elements, into the building in the summer and out of it in the winter.
- **Weatherstripping**
- **Gaps in interfaces between different materials**
- **Window replacements, window films**
- **May allow you to reduce capacity of HVAC**

Heating and Air Conditioning



- HVAC (heating, ventilating, and air-conditioning) accounts for 40% to 60% of the energy used in U.S. commercial buildings
- Duct sealing and insulating: 10 to 20 percent of the air from an HVAC supply fan may be wasted through leaks in commercial buildings – conditioning space above drop ceilings
- Proper sizing and set up (lighting, building envelope affect this)

Why Participate in an Energy Initiative?



- It saves the organization money
- It reduces the environmental impact of operations
- It conserves irreplaceable energy producing resources
- It can show leadership in environmental awareness and action

Steps to Reducing Energy Use

- **Baseline assessment by independent entity**
 - Analysis of energy bills, energy using systems, and building envelope
- **Examine operations for conservation opportunities, educate staff**
- **Equipment & Retrofits**
 - If financial resources are limited, look at fastest payback investments first, and use savings for additional projects
 - Establish budget for your energy initiative, and then set acceptable payback parameters
- **Emissions**
 - Track your energy savings compared to your baseline to claim any carbon reduction credits



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