WARREN

RHODE ISLAND

Strategic Energy Plan | Executive Summary

The Strategic Energy Plan provides a high level, comprehensive assessment of energy use throughout Warren's municipal operations, including facilities, vehicles, and public lighting. Based on this assessment, the Strategic Energy Plan identifies specific strategies for the Town to implement to reduce overall energy use and associated costs. In addition to costs, the Town recognizes that reducing energy consumption will also reduce the Town's environmental impact, specifically its contribution to emitting greenhouse gases, which are known to cause climate change.

RESULTS OF ENERGY BASELINE ASSESSMENT

The Town selected Calendar Year (CY) 2009 as the baseline year from which to measure all progress. For CY 2009, the Town of Warren's total energy consumption was equivalent to 26,804 MMBTU (units of energy are expressed in MMBTU or million British Thermal Units to allow for consumption comparisons among fuels that are measured in different units). This energy usage results in the emission of 2,485 metric tons of carbon dioxide equivalent (CO2e). That amount of greenhouse gas (GHG) emissions would require 530 acres of pine forest to absorb it in one year[1] (imagine 400 football fields of pine trees). Table 1 below summarizes the results of the Energy Baseline by sector. Figure 1 on the next page shows the percentage comparisons of each sector to total energy use.

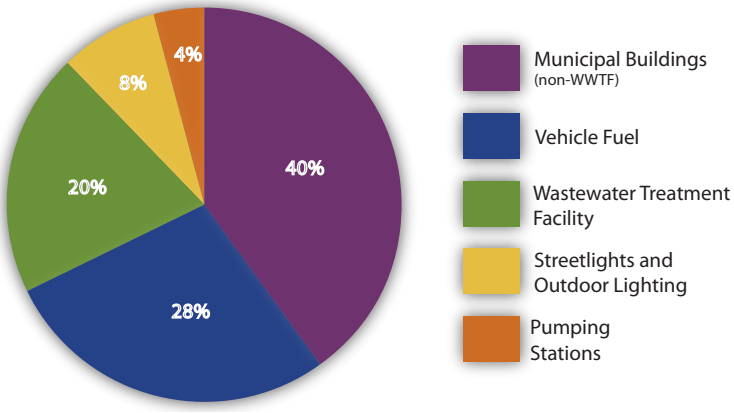
TABLE 1 ENERGY BASELINE CY09

SECTOR	MMBTU TOTAL	ENERGY COST TOTAL	TOTAL CO2E (METRIC TONS)
Municipal Buildings (non-WWTF)	10,781	$ 295,983.98	1008
Vehicle Fuel	7,443	$ 145,466.00	538
Wastewater Treatment Facility	5,386	$ 174,010.42	557
Streetlights and Outdoor Lighting	2,208	$ 172,082.34	274
Pumping Stations	985	$ 41,276.89	108
TOTAL	**26,804**	**$ 828,819.63**	**2,485**

1 U.S. EPA Greenhouse Gas Equivalencies Calculator (http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results)

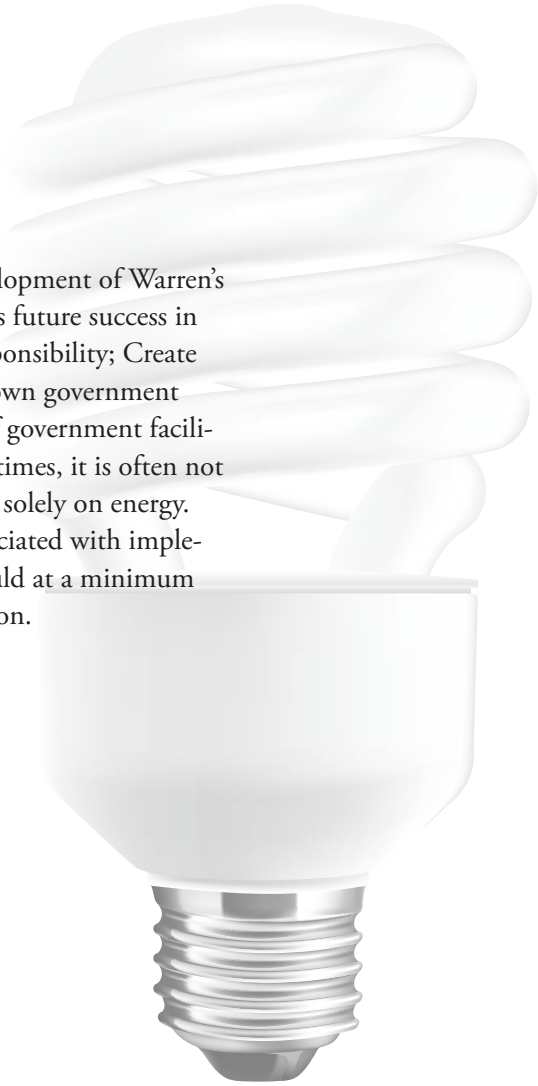
Like many local governments, Warren's area of primary energy usage is its buildings. Fortunately, there are many tools, resources, and incentive programs associated with energy efficiency in existing buildings. Therefore, it makes sense for Warren to spend a majority of its effort implementing efficiency measures in its buildings and the bulk of recommendations in the Strategic Energy Plan focus on that sector.

FIGURE1
BREAKDOWN OF ENERGY USE BY SECTOR, CYO9



CHALLENGES AND SOLUTIONS

The energy baseline assessment process associated with the development of Warren's Strategic Energy Plan uncovered a few key barriers to the Town's future success in managing its energy use and thereby saving money: Assign Responsibility; Create a System; and Implement. Firstly, there is no position within Town government that has the responsibility for the overall energy management of government facilities- from a usage or a tracking perspective. In these tight fiscal times, it is often not feasible for a Town the size of Warren to hire a position focused solely on energy. However, given the significant money saving opportunities associated with implementing energy efficiency policies and strategies, the Town should at a minimum consider incorporating this responsibility into an existing position.



RECOMMENDED ENERGY EFFICIENCY STRATEGIES

Additionally, the Town does not have an organized system that maintains basic building information, such as square footage, or track energy usage through utility data. While utility bills are paid and costs accounted for in financial systems, the energy use (kWh, therms, gallons, etc) is not tracked or identified in an organized fashion. Effectively tracking energy use is completely dependent on having an understanding and accounting of all facilities, meters and accounts. The square footage information is necessary to calculate the overall energy intensity of a building, or its efficiency. Fortunately, the first step to address this barrier has been taken and the Town now has a complete list of its 82 utility accounts. The accounts and associated data have been mapped to specific Town facilities and entered into Energy Star's Portfolio Manager web-based tool. This will facilitate the benchmarking and tracking of Town energy consumption for the future. The framework for the system is there now, all that Warren has to do is assign responsibility for someone to implement it.

The results of the energy baseline assessment associated with the Strategic Energy Plan provide a guide for the town to determine which facilities to prioritize for potential upgrades. The next step in the process is conducting energy audits of the most energy intensive facilities. Energy audits are an essential low or no cost effort to identify specific energy efficiency measures for each building and determine the potential savings. The Town of Warren has completed energy audits at Town Hall and Government Center, the results of which have included recommendations for improving energy efficiency in these facilities. The Town should use this Strategic Energy Plan as the foundation to identify the next set of buildings to receive energy audits. While the Plan provides some general recommendations (see Recommended Energy Reduction Strategies section of complete plan), an in-person energy audit can identify more specific weaknesses in building performance, recommend improvements, and provide cost and savings estimates. Table 2 on the next page summarizes some specific and general Energy Conservation Measures that may be effective for reducing overall energy use in Warren.

Additional policy/programmatic recommendations for the Town include:

- Enact an energy efficiency policy for Town and incorporate this policy into the Comprehensive Plan and the Capital Improvements Program for the annual budget
- Implement energy efficiency strategies throughout municipal buildings
- Adopt Environmentally Preferable Purchasing (EPP) Program policies
- Institute a Green Fleets Program
- Pursue installation of solar Photovoltaic and/or hot water for municipal facilities
- Continue to pursue regional renewable energy projects, including wind and solar projects
- Establish a Revolving Energy Fund

TABLE 2 | EXAMPLE ENERGY CONSERVATION MEASURES

ENERGY CONSERVATION MEASURE	LOCATION	NET COST	SAVINGS
Computer Power Management	All Buildings	No cost	700 to 750 kWh per computer annually
Clean and/or replace filters in HVAC system frequently	All Buildings	No- to low-cost	unknown
Install Low-flow water fixtures (savings from heating less hot water)	All Buildings	No- to low-cost	unknown
Replace incadescent bulbs with CFLs	All Buildings	No- to low-cost	unknown
Replace office equipment/appliances with Energy Star models (when replacing)	All Buildings	No- to low-cost	unknown
Seal leaks (in insulation, ducts, walls, windows, doors)	All Buildings	No- to low-cost	unknown
Use ceiling fans in winter (to distribute heat downward) and summer (for cooling)	All Buildings	No- to low-cost	unknown
Wall and roof insulation	All Buildings	$1.20 to $2.50 per sq ft for sprayed foam or batt insulation	10-40% energy savings
Occupancy Sensors for Lighting	All Buildings	$15 to $200 (depending on product and application)	17 to 60%
Demand Controlled Ventilation (DCV) System	All Buildings	$700- $900 per zone	$0.05 to more than $1.00 per sq ft of space; 27-42% heating energy savings
Energy/Heat Recovery Ventilation (ERV/HRV)	All Buildings	$700-$2,000	30% of baseline natural gas use
Programmable Thermostats	All Buildings	$90- $110 per thermostat (with rebate)	10% of heating and cooling costs
Computerized Maintenance Monitoring System (CMMS)	All Buildings	Varies	19% materials cost savings; 20% reduction in equipment downtime; 28% increase in maintenance productivity
Energy Management System (EMS)	All Buildings	Varies	minimum 10% savings; minimum 1,078 MMBTU savings, or $29,598 if implemented in all facilities
90% Efficiency Condensing Unit Heater	Government Center	$3,500	$561
Low Intensity Infrared Heaters (apparatus space)	Government Center	$18,800	$2,077
High Efficiency Condensing Boiler	Government Center	$32,700	$3,838
LED Streetlights	Streetlights	Varies	40% to 50% of annual kWh
Boiler Reset Control	Town Hall	$1,650	3-7% heating energy savings
Relamp and reballast from T8 to Super T8	Town Hall	$5,000	14,050 kWh or $1,528
Envelope Improvements (attic insulation, drop ceiling)	Town Hall	$6,300	$1,878
Insulate Domestic Hot Water & Heating Pipes	Town Hall	Unknown	
Replace Heating and Hot Water Equipment with Properly Sized Equipment	Town Hall	Unknown	15-35% heating energy savings