



TOWN OF WESTERLY

Energy Management Plan

Rev-0

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Town of Westerly, Rhode Island Energy Management Plan

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I. INTRODUCTION

The Town of Westerly believes that monitoring and managing the energy performance of its facilities and fleet are critical for mitigating against high and volatile energy prices, lowering operating costs, and reducing greenhouse gas emissions. This Energy Management Plan serves as a roadmap to guide decision-making and action toward a more sustainable future. Specifically, it sets a quantitative energy reduction goal, a renewable energy goal, a low-emissions vehicle fleet goal and specific strategies for achieving these goals.

The Energy Management Plan enclosed represents a starting point for Westerly to formalize their sustainability goals and planned actions. This plan will be a living document that is updated regularly to track progress and expand the depth and comprehensiveness of the energy program for Westerly. It is anticipated that in 2017 the plan will be updated to include detailed information on the energy baseline and performance and accomplishments achieved from that baseline; additionally, we anticipate that the planned Strategies and Actions will grow as more input is received from Westerly constituents.

ENERGY POLICY STATEMENT

Westerly encourages and supports an energy conservation and management program for its facilities in order to lower energy consumption and costs and to reduce the environmental impact of its operations. In this regard, it is the responsibility of each and every official and employee to participate actively in conservation and management efforts. In implementing this program, every effort will be made to maintain business operations and comfort levels throughout its facilities. It is the responsibility of Westerly to implement, direct, monitor, evaluate, and report on energy conservation and renewable energy efforts. Therefore, Westerly hereby commits to implementing immediate and long-term plans to conserve energy resources, specifically, the strategies outlined in this Plan. These efforts will guide and support best management practices for sustainable energy management.

II. ENERGY REDUCTION & RENEWABLE ENERGY GOALS

A clear and measurable energy reduction goal is critical for understanding intended results, developing effective strategies, and realizing significant energy savings. Therefore, Westerly commits to the following building energy efficiency, renewable energy and zero-emission vehicle fleet goals.

Westerly commits to achieving a 25% reduction in energy consumption below Fiscal Year 2013 levels by 2020 across the non-school town facilities.

Westerly is already on track to meet this goal through recent and current clean energy projects. Westerly entered into an Energy Savings Performance Contract that was completed in 2014. These projects were verified to reduce utility costs by \$57,186 during the first year performance period, resulting in an 18% reduction in electricity usage and a 20% reduction in fossil fuel usage for the municipal buildings included in the program.

Westerly is undergoing energy savings retrofits and participating in the Rhode Island Infrastructure Bank's Efficiency Buildings Fund Project Priority List Round 1. These projects include energy efficiency work at the Town Hall, The Highway Garage/Department of Public Works and the Police Department.

Additionally, Westerly is investigating several other potential energy efficiency improvements throughout the Town's non-school buildings that are described in greater detail in the action plan.

Westerly is also committed to achieving the following stretch sustainability goals and strategies that further demonstrates the Town's commitment to practical and cost effective sustainability initiatives.

Westerly will strive to achieve 100% of Town and School electricity consumption by renewable energy sources by 2020. This Town stretch goal is an acceleration of the 2025 State of Rhode Island Lead by Example Executive Order renewable energy goal for State Agencies.

Westerly will strive to reduce fossil fuel use and GHG emissions from Town municipal vehicle fleet fossil fuel consumption with a goal of a minimum of 25% of new light-duty Town fleet purchases and leases to be zero-emission vehicles by 2020. This Town stretch goal is an acceleration of the 2025 State of Rhode Island Lead by Example Executive Order State fleet zero emission goal for State Agencies.

In order to effectively manage these efforts and track and report on program performance, Westerly will work to build internal capacities to effectively manage energy efficiency and renewable energy efforts, procure utilities and monitor energy use.

The following action plan outlines concrete strategies that Westerly will undertake to continue this important work and meet its aggressive energy and sustainability goals.

III. ACTION PLAN

This action plan outlines steps that Westerly will take in the coming years to more thoroughly assess opportunities, implement clean energy initiatives, and achieve its energy reduction goals.

SUMMARY OF ENERGY REDUCTION STRATEGIES & ACTIONS

Strategies	Responsible Department(s)
Strategy 1 Reduce energy usage and increase energy efficiency in Westerly owned municipal facilities.	
Action 1.1 Identify and implement energy efficiency opportunities in Town owned municipal facilities	Department of Public Works
Action 1.2 Implement retrocommissioning and control system upgrades for buildings that have DDC HVAC control systems and high energy use	Department of Public Works
Action 1.3 Purchase utility company owned street lighting and convert to high efficiency LED lighting	Department of Public Works
Action 1.4 Implement plug load controls and power management software solution for computer, peripherals and other plug loads	Department of Public Works & Information Technology
Strategy 2 Utilize cost-effective renewable energy for Town and School electricity usage.	
Action 2.1 Participate in a shared renewable energy project for Town and School electricity accounts through a “Public Entity Net Metering Financing Arrangement”	Town Manager’s Office
Action 2.2 Implement a solar renewable energy demonstration project at the Town Department of Public Works	Department of Public Works
Strategy 3 Utilize zero-emission electric vehicles when practical and reduce fleet fossil fuel usage.	
Action 3.1 Participate in the “Charge Up!- Rhode Island Public Sector Vehicle Electrification Program” to purchase one electric vehicle and install one electric charging station	Town Manager’s Office & Purchasing Department
Action 3.2 Replace 25% of end of life light-duty vehicles with zero emission vehicles and remaining end of life vehicle replacements with fuel efficiency in top 20% of category	Purchasing Department
Action 3.3 Provide vehicle idling reduction control systems on select Police, other emergency vehicles & Public Works	Police Department & Department of Public Works

STRATEGY 1: Reduce energy usage and increase energy efficiency in Westerly owned municipal facilities.

Action 1.1 – Identify and implement energy efficiency opportunities in Town owned municipal facilities.

Westerly entered into an Energy Savings Performance Contract that included lighting, weatherization, temperature controls, boilers, pipe insulation, water fixture and ventilation system efficiency upgrades that were completed in 2014. These projects were verified to reduce utility costs by \$57,186 during the first year performance period, resulting in an 18% reduction in electricity usage and a 20% reduction in fossil fuel usage for the municipal buildings included in the program.

Westerly is undergoing additional energy savings retrofits and participating in the Rhode Island Infrastructure Bank's Efficiency buildings Fund Project Priority List Round 1. These projects include work at the Town Hall, The Highway Garage/Department of Public Works and the Police Department. The Town Hall energy efficiency work includes attic insulation, a heater replacement, a motor replacement and the installation of LED light fixtures which will reduce energy use by 13%. The Highway Garage includes an LED lighting conversion that will reduce electricity usage in the garage by 65%. The Police Department includes an LED lighting conversion that should reduce the Police Station electricity consumption by 15%.

Action 1.2 – Implement retrocommissioning & control system upgrades for buildings that have DDC HVAC control systems and high energy use.

Retro-commissioning is the application of the commissioning process to existing buildings. Retrocommissioning is a process that seeks to improve how building equipment and systems function together. Depending on the age of the building, retrocommissioning can often resolve problems that occurred during design or construction, or address problems that have developed throughout the building's life. In all, retrocommissioning improves a building's operations and maintenance (O&M) procedures to enhance overall building performance and save energy.¹

Evan Mills, Lawrence Berkley National Laboratory (LBNL), 2009: "Building Commissioning: A Golden Opportunity for Reducing Energy Costs and Greenhouse-gas Emissions" provides the world's largest database of commissioning case studies for new and existing buildings. LBNL gathered and analyzed data on 643 buildings, representing 99 million square feet of floor space from 26 states.

Key retro-commissioning findings:¹

- Median whole-building energy savings: 16%
- Median payback times: 1.1 years
- Cash-on-cash returns: 91%

The Town of Westerly will evaluate its major buildings that have direct digital control (DDC) controls system and higher than expected energy to determine if retro-commissioning might be a cost-effective energy efficiency strategy. A preliminary assessment of the Westerly Police

¹ Lawrence Berkley National Laboratory (LBNL)

Department has been conducted and it has been confirmed that the Police Department has high energy usage and a DDC control system that requires an upgrade and retro-commissioning. The Westerly Police Department was constructed in 2008, operates 24/7 and has very high energy usage. The HVAC system is controlled by a direct digital control (DDC) controls system, provided with a graphic user interface front end control computer and software package. The original DDC control system was a KMC Controls system was never properly commissioned after installation and is malfunctioning. The malfunctioning controls are creating issues with how the HVAC equipment operates. Some of the issues noted include simultaneously heating and cooling spaces, abnormally low discharge air temperature from the RTU resulting in high electric reheat use, and poor control of space temperatures resulting in frequent hot and cold complaints. The existing control system requires an upgrade that includes a new front end PC, new software and upgraded controllers. The upgraded control system can then be retro-commissioned and more energy efficient sequences of operation can be implemented.

After the Westerly Police Department DDC control system is upgraded and retro-commissioned, other Town buildings with DDC control systems and higher than expected energy usage can be evaluated for retro-commissioning opportunities.

Action 1.3 – Purchase utility company owned street lighting and convert to high efficiency LED.

Conversion to more energy efficient LED fixtures throughout public roadways is one method for towns and cities to capture substantial long-term energy consumption and cost savings. Replacement of traditional high-pressure sodium (HPS) lighting with LEDs offers numerous benefits, including, but not limited to:

1. Significant energy reduction potential. Depending on the type of fixture installed and dimming strategy utilized, streetlight LEDs can reduce kilowatt usage from anywhere between 50 to 65 percent. These reductions can translate into cost savings for public sector entities and taxpayers.
2. Installation of control technologies (along with conversion to an LED fixture) can offer public sector entities much greater control of their lighting quality (i.e. dimming) and scheduling across public roadways and other infrastructure.
3. LED conversion can help reduce maintenance and related equipment costs. For example, in comparison to traditional HPS fixtures, the newest LEDs have warranted lifespans from 10 to 20+ years.
4. LED lighting can enhance the quality of roadway lighting and safety.
5. Energy reductions stemming from LED conversions can not only save the public money and help reduce budgetary constraints, but they also help reduce greenhouse gas emissions and our carbon footprint, thereby enhancing a community's "green" image.

As of August 1, 2014, Rhode Island municipalities are able to purchase and maintain their own street lights pursuant to the [Municipal Streetlight Investment Act](#). For municipalities planning

to purchase existing National Grid-owned streetlights – there are financial incentives available to assist with LED streetlight conversion.²

Westerly has already completed the LED retrofit of 118 Town-owned exterior and street lights in downtown Westerly. The process is currently underway to purchase all existing National Grid-owned streetlights that the Town is paying for on a monthly basis through NGRID utility invoices. The Town plans to purchase and convert to LED all streetlights that are eligible for purchase from NGRID and have associated financial incentives for conversion to LED.

Action 1.4 – Implement plug load controls and power management software solution for computer, peripherals and other plug loads.

Plug and process loads (PPLs) consume about one-third of the primary energy in U.S. commercial buildings. PPLs cover a wide variety of electronic, computer, refrigeration, and cooking devices, including essential equipment for information processing.

PPLs account for an increasingly large percentage of commercial building energy use. The primary energy use associated with PPLs is projected to grow from 30% to 35% of total commercial building energy use between 2010 and 2025 because the number and energy intensity of plug-in devices continue to increase (source: U. S. Department of Energy).

It is proposed to investigate the installation of a plug load management system to provide a networked and automated remote shut down of selected office and IT equipment plug loads. The following municipal buildings may represent a good opportunity for PPL controls: Town Hall, Police Department and the Department of Public Works. A survey of spaces will determine the quantity of smart power strips, smart outlets, plug load switches, occupancy sensors, panel/circuit monitors that will be required and estimate the cost and savings to help determine viability. The Westerly IT Department will assist with the plug load control system design to determine control strategies and how a centralized computer power management software solution can best be deployed.

² State of Rhode Island Office of Energy Resources

STRATEGY 2: Utilize cost-effective renewable energy for Town and School electricity usage

Westerly will strive to achieve 100% of Town and School electricity consumption by renewable energy sources by 2020. This Town stretch goal is an acceleration of the 2025 State of Rhode Island Lead by Example Executive Order renewable energy goal for State Agencies. The achievement of the stretch renewable energy goal will be accomplished by utilizing shared renewable energy resources that participate in the State of Rhode Island Renewable Net Metering Credit Program and by completing an on-site solar renewable energy demonstration project at the Town's Department of Public Works building.

Action 2.1 – Participate in a shared renewable energy project for Town and School electricity accounts through a “Public Entity Net Metering Financing Arrangement”.

Westerly began the pursuit of utilizing a shared renewable energy resource in 2016 after the recently updated Rhode Island Net Metering provision. The Net-Metering program allows homeowners, businesses, and municipalities to offset their electricity usage with eligible renewable energy technologies. Net-metered renewable energy installations are generally sized to meet a property's electric demand. The net metering provisions allow RI municipalities to enter into a “Public Entity Net Metering Financing Arrangement” with a private entity to facilitate the financing and operation of a renewable energy Net Metering resource in which the private entity owns and operates the renewable energy resource on behalf of the public entity. The renewable energy production is tied to the consumption of electricity occurring at the designated public entity net metered accounts. The provisions permit public entities such as the Town of Westerly to support the development of a renewable energy project, such as a wind farm or solar PV field and receive a credit and net savings on the Town's electricity bill.

Westerly began the pursuit of a net meter project by developing and issuing a Request of Proposal for a virtual net metering project. Five proposals were received, with four proposers offering Solar PV and one proposer offering a wind renewable energy resource. Ultimately, three solar proposers could utilize a Public Entity Net Metering Financing Arrangement to provide up to 100% of the Westerly electricity load.

Action 2.2 – Implement a solar renewable energy demonstration project at the Town Department of Public Works.

The Department of Public Works represents one of the better opportunities for locating a solar demonstration project. Rooftop solar tends to be more cost effective than ground mounted solar displays and since the Public Works building is relatively new and has a metal roof, the roof has an expected life remaining that will likely exceed the useful life of a solar array. Solar is proposed to be located on the side and front of the building and will likely produce nearly 75% of the anticipated building electricity usage (anticipated consumption after the lighting retrofit is completed). The anticipated solar array will be approximately 65 kW DC.



STRATEGY 3: Utilize zero-emission electric vehicles when practical and reduce fleet fossil fuel usage

Westerly will strive to reduce fossil fuel use and GHG emissions from Town municipal vehicle fleet fossil fuel consumption with a goal of a minimum of 25% of new light-duty Town fleet purchases and leases to be zero-emission vehicles by 2020. This Town stretch goal is an acceleration of the 2025 State of Rhode Island Lead by Example Executive Order State fleet zero emission goal for State Agencies. This goal will be initiated by participating in the “Charge Up!- Rhode Island Public Sector Vehicle Electrification Program” to purchase one electric vehicle and install one electric charging station.

Action 3.1 – Participate in the “Charge Up!- Rhode Island Public Sector Vehicle Electrification Program” to purchase one electric vehicle and install one electric charging station.

The Rhode Island Charge Up! Program offers incentives to state agencies and municipalities interested in installing electric vehicle supply equipment (EVSE or charging stations) at publically-accessible facilities, and supports the purchase or lease of electric vehicles (EVs) for integration into public sector fleets. Qualified public sector applicants may be eligible to receive a total award of up to \$75,000 to support their adoption of clean transportation solutions.



Through Charge Up!, applicants may qualify for up to \$60,000 in incentives to support the purchase and installation of electric vehicle charging stations (Level II or higher). EVSEs that are installed and made operational on or after July 1, 2016 will be qualified under this incentive program. In addition, applicants that install at least one charging station through this program may also qualify for up to \$15,000 to support the purchase or lease of a new electric vehicle as part of their public sector fleet. EVs with a completed purchase or lease agreement effective on or after July 1, 2016 will be qualified under this incentive program.

Westerly will complete an application for the purchase of one electric vehicle and one electric vehicle charging station.

Action 3.2 – Replace 25% of end of life light-duty vehicles with zero emission vehicles and remaining end of life vehicle replacements with fuel efficiency in top 20% of category.

Westerly plans to replace 25% of end of life light-duty vehicles with zero emission vehicles by 2020. This is an acceleration of the Rhode Island Lead by Example Executive Order established for State agencies, including the development of strategies for reducing fossil fuel use and GHG emissions from the State fleet, with a goal of ensuring that a minimum of 25% of new light-duty state fleet purchases and leases will be zero-emission vehicles by 2025.

Additionally, Westerly will replace the remaining 75% of the end of life replacement vehicles with vehicles that have fuel efficiency in the top 20%. If available for the vehicle category, the SmartWay certification will be utilized to help identify vehicles with fuel efficiency in the top 20%.

What are SmartWay Certified Vehicles?

Each model year, the EPA rates every new car, truck, and Sport Utility Vehicle (SUV) for greenhouse gas and smog-forming emissions on scales of



1-10. To earn the SmartWay designation, a vehicle must receive a combined score from both scales that is much better than the average vehicle.³

Action 3.3 – Provide vehicle idling reduction control systems on select Police, other emergency vehicles & Public Works

Emergency vehicles, such as police cars, ambulances, and fire trucks are often exempt from laws that limit engine idling because of heavy power consumption that can rapidly drain batteries if the engine is off. However, these vehicles can save fuel and reduce emissions with technologies that allow them to perform vital services without idling. Police cruisers spend much of their time parked and running while officers monitor traffic, help at accident scenes, write reports, and wait to be called. Officers commonly require lights, radios, computers, radar, and video cameras. In one recent report about police vehicle fuel consumption, the cruiser studied was found to idle 60% of the time during normal operation and used 21% of its total fuel while parked.⁴ While the engine provided 250 horsepower (hp), together all of the accessories needed less than 2 hp. (Air conditioning consumed the most power, followed by external lighting.) Several idling-reduction systems, with varying capabilities and costs, are available for police vehicles. Power-management systems may significantly reduce (but not eliminate) idling. They allow the vehicle's battery to power auxiliaries in engine off mode and monitor the battery's state-of-charge. When the battery charge falls below a preset threshold, the system restarts the vehicle's engine to recharge the battery. Westerly will evaluate the cost effectiveness of outfitting police cars with idling-reduction systems and implement if this measure is cost effective and does not interfere with operations. If idling reduction technologies are successful in police cars the Town will evaluate these technologies for other emergency vehicles.



³ U.S. Environmental Protection Agency

⁴ Eric Rask, et al., Argonne National Laboratory, Final Report: Police Cruiser Fuel Consumption Characterization, for the Illinois State Toll Highway Authority (February 2013)