The Greening of Barrington

How a town acts to improve its environmental sustainability

2012 Land & Water Conservation Summit
Cynthia Fuller, Barrington Conservation Commission

Two Sparks in 2007

- Wind Power Exploratory Committee in, later as the Committee for Renewable Energy for Barrington (CREB)

- Conservation Commission's "Barrington Goes Green: An Environmental Mandate for the 21st Century"

Wind Power Exploratory Committee

- Volunteer group to evaluate the feasibility of a wind turbine in town
- Findings: Barrington could sustain a turbine at five locations at a start-up cost of $1.2-$1.4 million
- Recommendation made to Town Council in June 2007
- Committee morphed into CREB with continued and expanded charge

Conservation Commission Ideas

Barrington Goes Green:

An Environmental Mandate for the 21st Century

Ideas for:

Municipal Operations • Energy Development

Waste Management/Recycling

Natural Resource Protection

Community Outreach/Education

I'll be talking about…

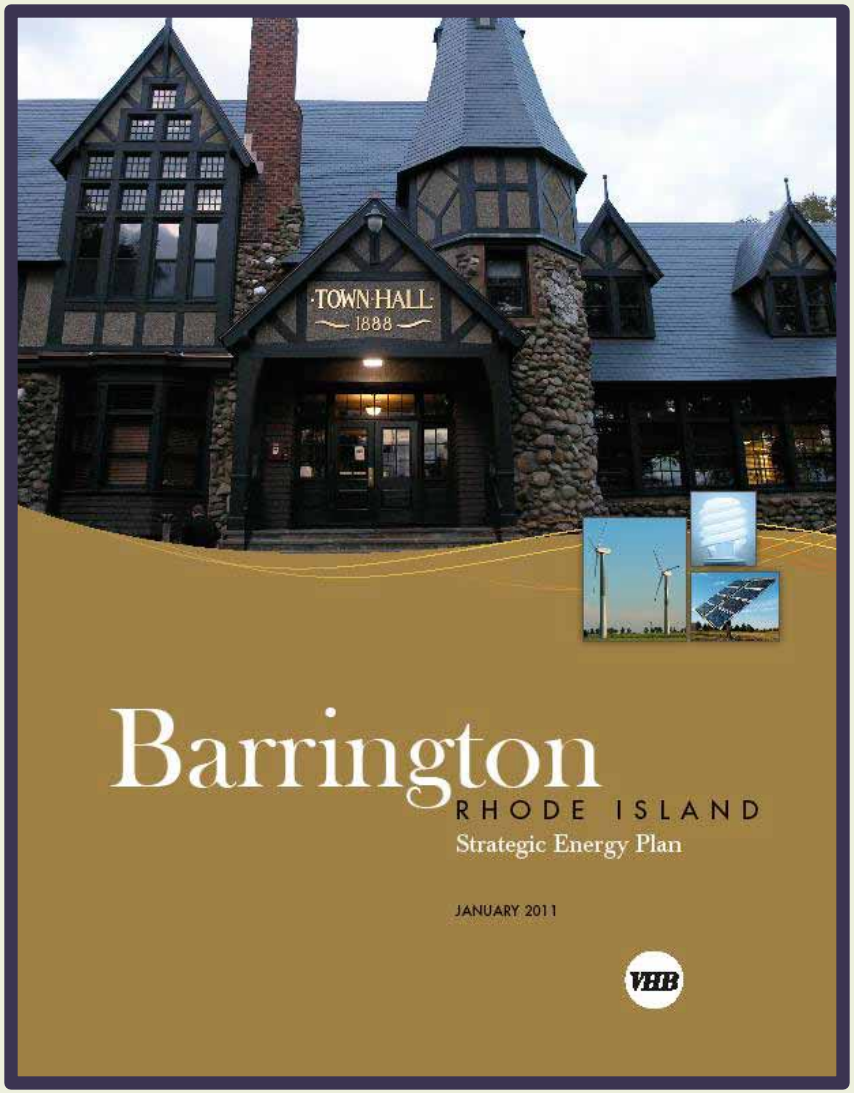
Municipal Operation Upgrades

The Wind Turbine Roller Coaster

Town Ordinances

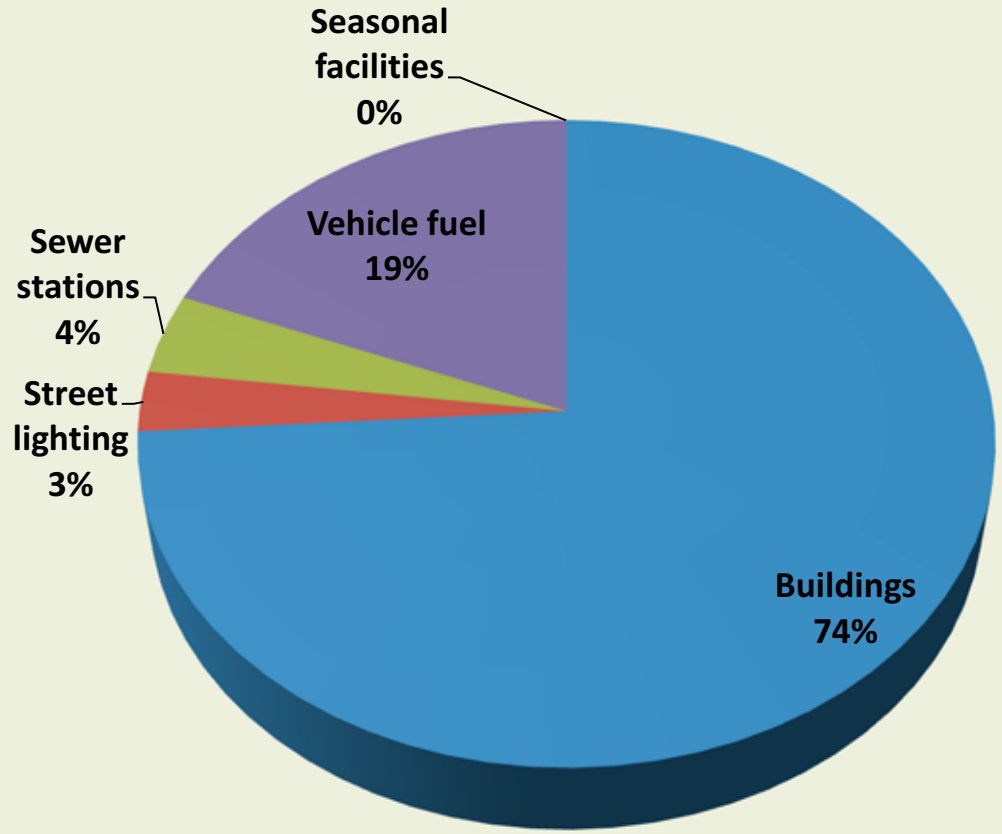
Natural Resources/Outdoors

Strategic Energy Plan



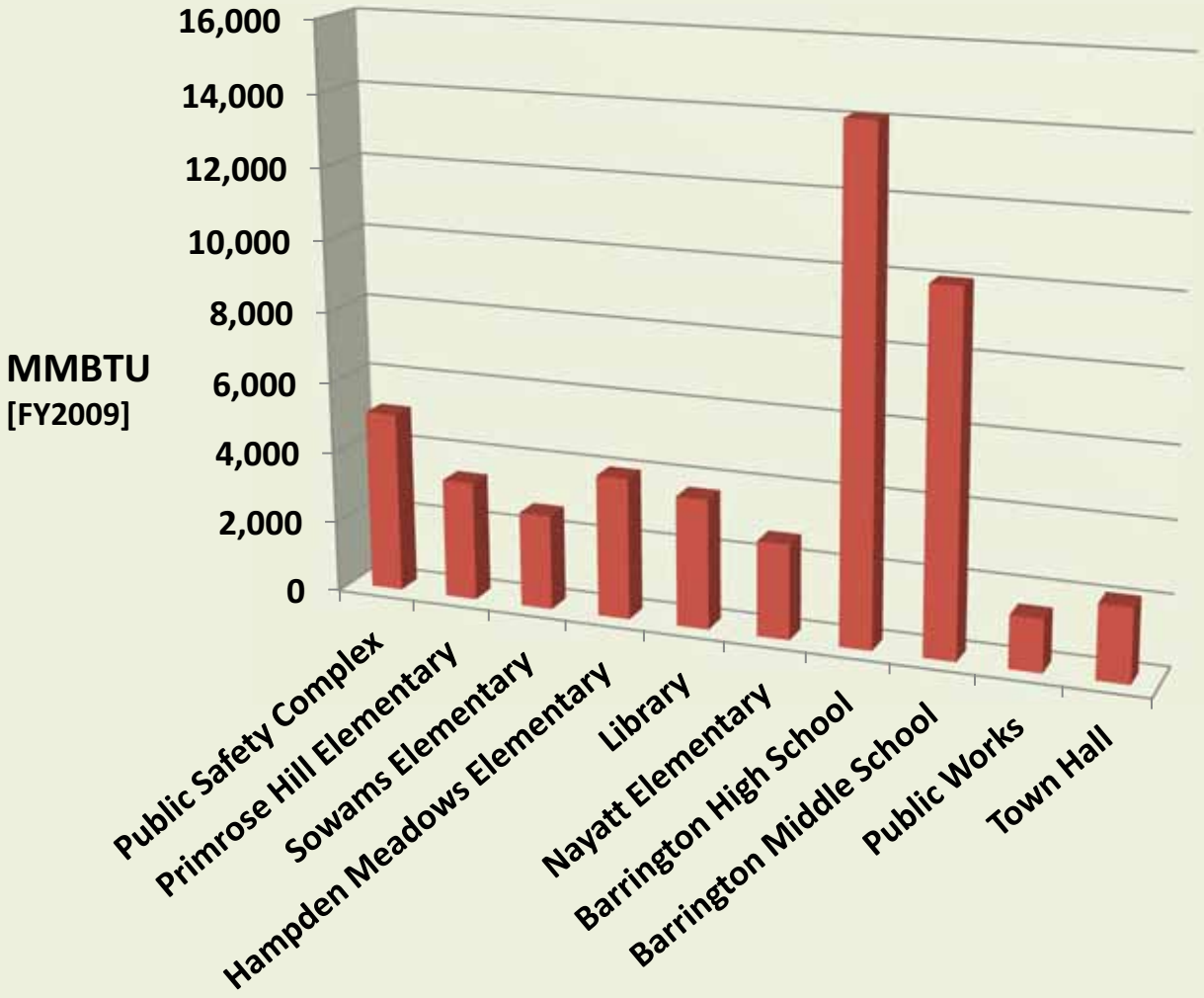
- Consultant-prepared
- Plan funded by an Energy Efficiency and Conservation Block Grant from the *RI Office of Energy Resources*
- Reviewed current energy use
- Provided strategies to reduce energy costs

First: Evaluate Current Energy Use



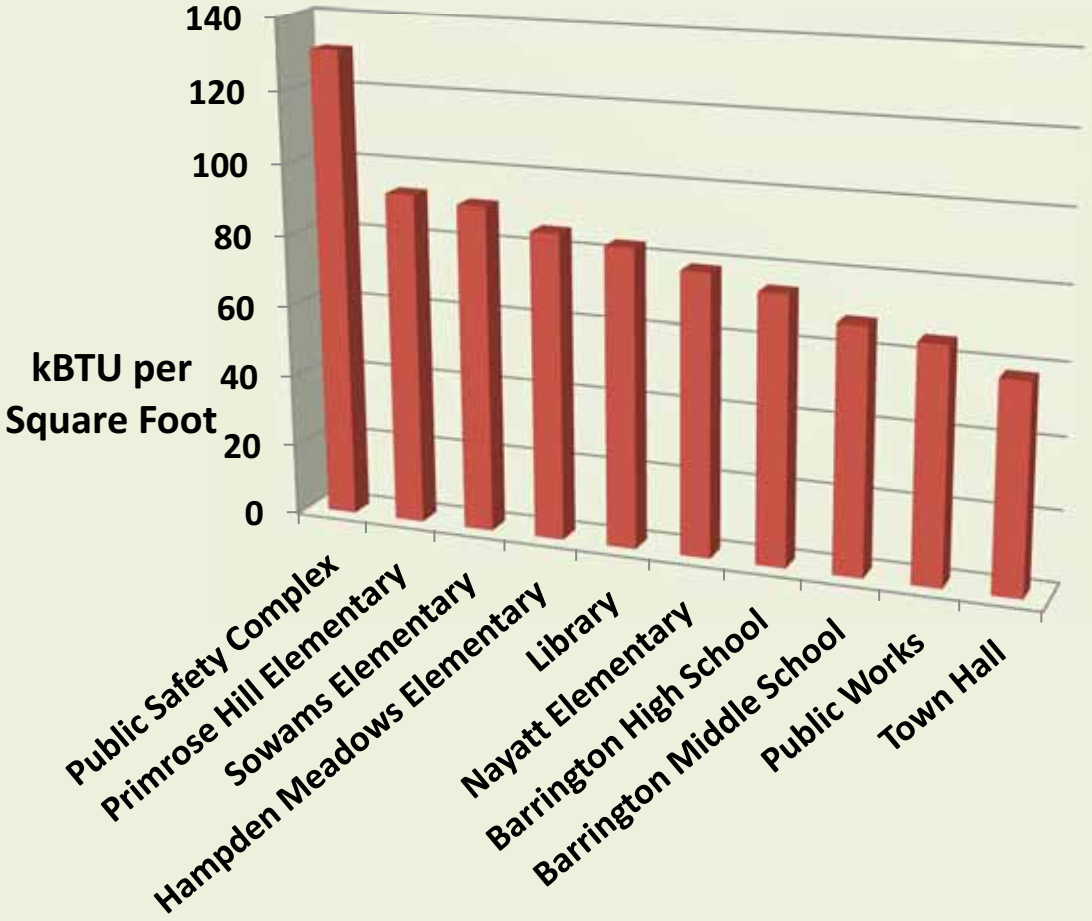
2009 Baseline Total Energy Use by Sector

Define Energy Users



- Greatest Energy Users: High School and Middle School
- Doesn't account for size or efficiency

Refine Understanding of Use



- Highest energy use per square foot: Public Safety Complex (Police/Fire - open 24 hr)
- Elementary schools least efficient in energy use

Goals/Objectives

- ***Goal 1*** - Reduce municipal/school energy use by at least 10% by 2015
  - Energy efficiency upgrades in buildings
  - Fuel efficiency in town fleet vehicles
  - Policies and financing mechanisms to support energy-reduction measures
- ***Goal 2*** – Encourage residents and businesses to adopt energy-conserving measures
  - Education and incentive programs
  - Green Business Program

Energy Efficiency Engineering Analysis

Energy Use

Thermal Building Construction

HVAC Systems/Controls

Hot water systems

Windows and Doors

Lighting

Ancillary Electrical Use

- Performed for Town Hall, Public Safety, and Library
- Detailed evaluation of energy use, building conditions
- Specific energy conservation measure recommendations, and costs

Actions - Public Safety Building

- Newer building (2000)
- Duct work and pipes insulated
- Boilers and water heater replaced (in progress)
- Over-ventilated!

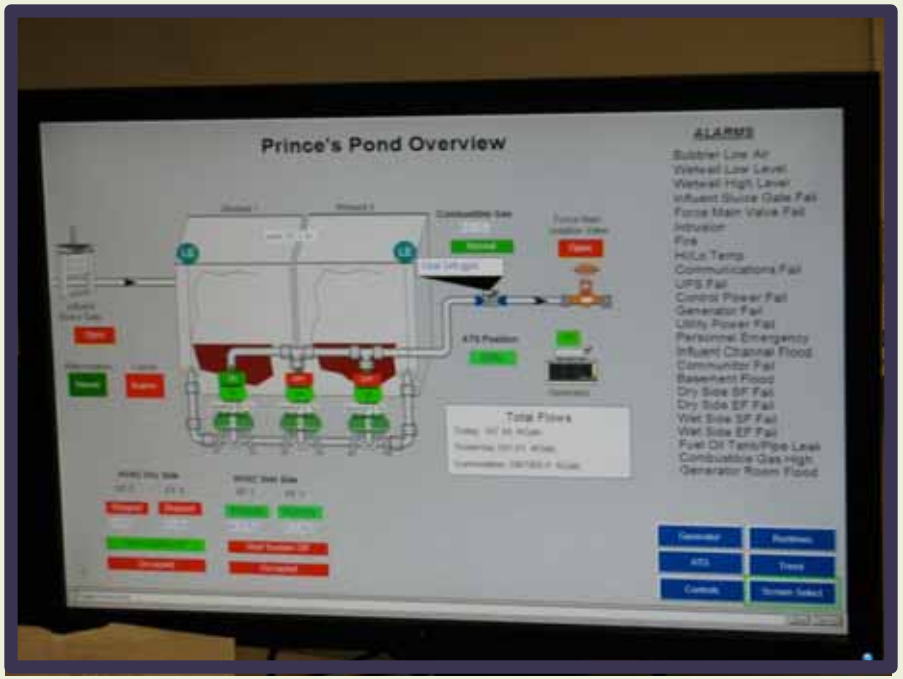
Actions – Library/Senior Center

New

- Boilers replaced
- New tank-less hot water heater installed
- Energy Management System installed

Actions - Department of Public Works

- New windows
- New ceiling insulation
- Programmable thermostats
- Occupancy-sensor light switches



- Automated wastewater monitoring system
- Replacement of constant speed wastewater pumps with variable rate pumps

Actions – School Operations

- All school buildings converted to natural gas heating
- White roofs installed at Nayatt and Primrose Hill schools
- Computerized heating controls in all buildings
- Automatic night-time shutdown script on all district computers

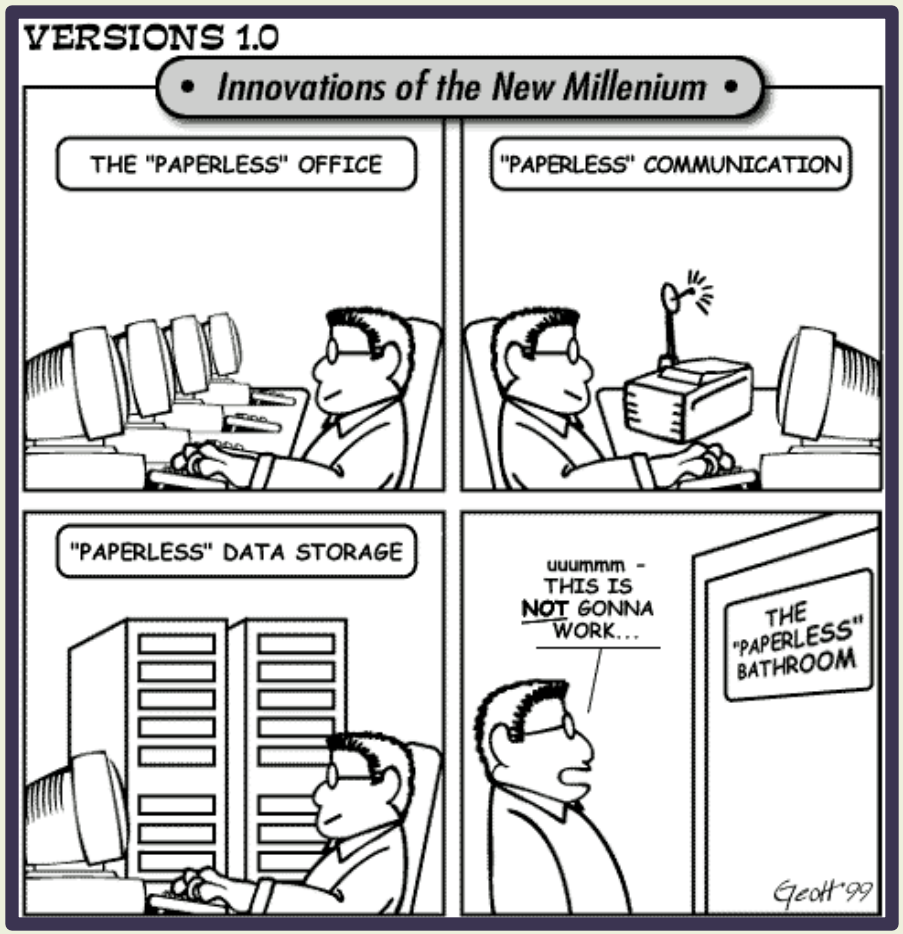
More Actions - School Operations

Uh oh!
Solar tubes and lighting on at same time! Time for education of staff!

- All school lighting upgraded to energy-efficient types
- Occupancy sensors installed in all classrooms and gyms
- Skylights and solar tubes added at two elementary schools to passively light hallways
- Looking into day-lighting for classrooms

Even More Action! School Operations

- Paperless purchase order system, time cards, and paycheck receipts
- Goal to reduce copier/printer paper use by 10%. Reduced by 5.66% in first year (that's 492,365 sheets of paper!)



From : http://www.theboomerrants.com

And Even More Actions!!

- Waterless urinals are being installed
- 1000-gallon rain barrels installed at Nayatt and Primrose Hill to collect roof runoff – used for watering school vegetable gardens and washing maintenance vehicles
- Some elementary schools are composing food waste for use in the school garden

Schools – Community Involvement

Established a **Green Committee**, composed of staff, students, teachers, and parents

Goals:

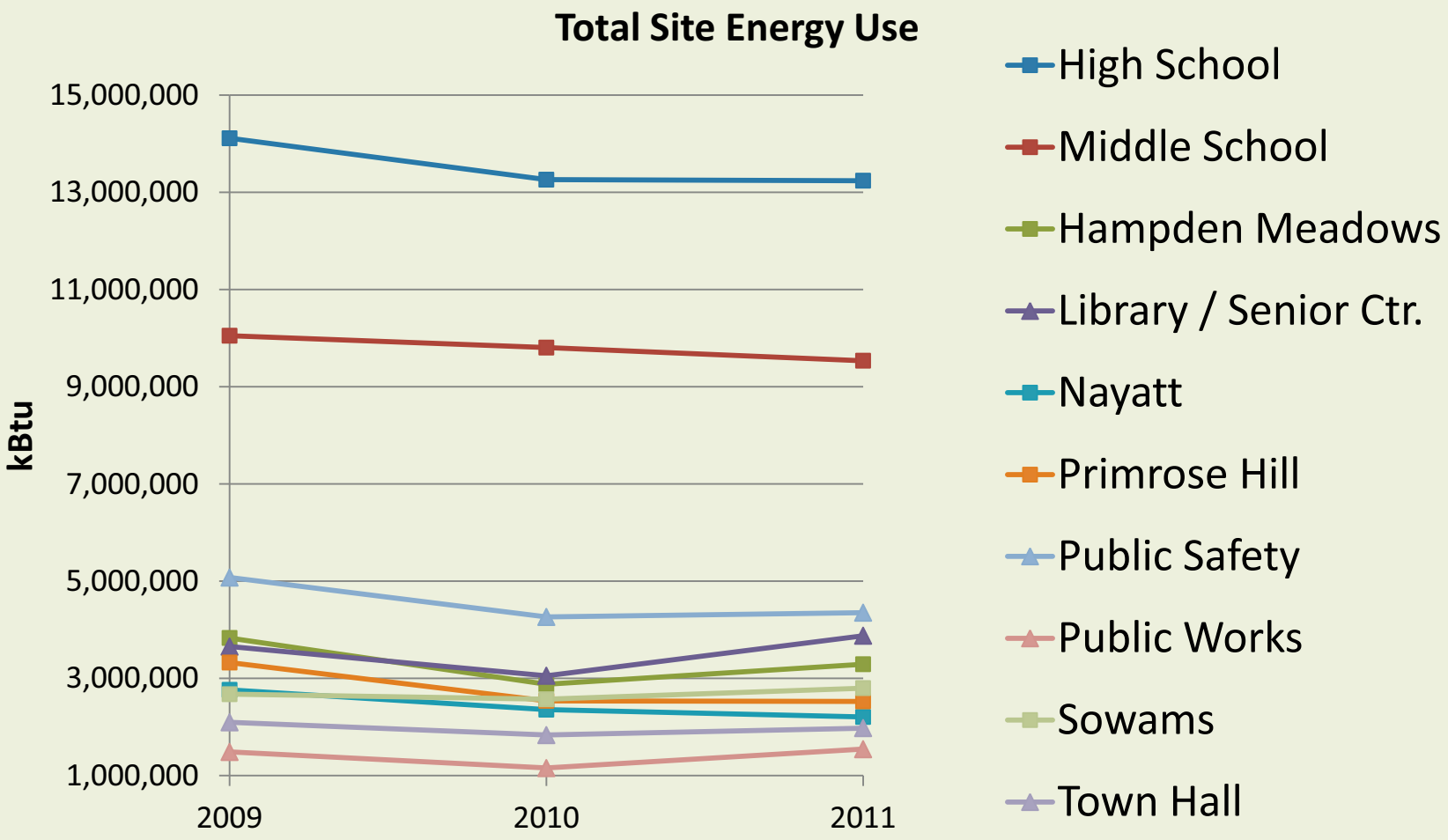
- Maximize recycling
- Provide education
- Promote student programs on environmental preservation and conservation

Schools – Environmental Education

- In 2011**: Alliance for Climate Education** (ACE) presentation at the Middle School (free program!). Geared to teens and young adults; engaging and highly rated.
- In 2012: **Cool The Earth** in elementary schools; a free, ready-to-run climate change assembly program that educates K-8 students about climate change and inspires them to take simple actions to reduce their carbon emissions.

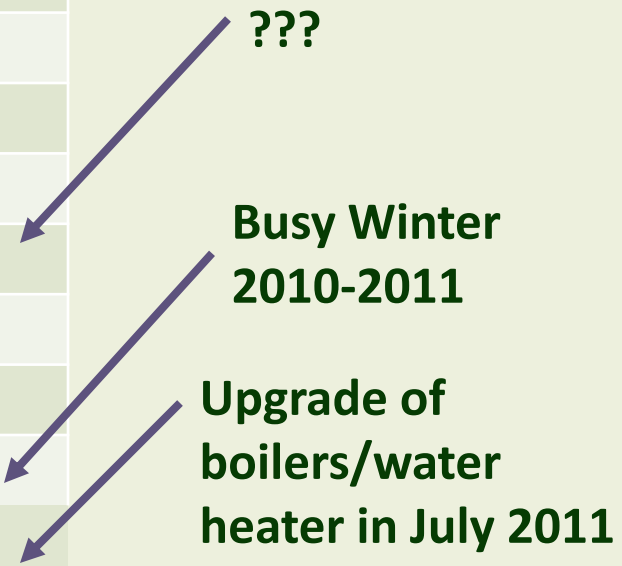
Results of Municipal and School "Greening" Activities…..

Energy Savings



Results to Date

Facility	2009 (Baseline) to 2011	
	Cost	Energy Use
High School	-9.24 %	-6.18 %
Middle School	-16.69 %	-5.11 %
Hampden Meadows	-20.54 %	-14.11 %
Nayatt	-29.93 %	-20.20 %
Primrose Hill	-45.48 %	-24.03 %
Sowams	- 2.65 %	4.71 %
Town Hall	-1.22 %	-5.65 %
Public Safety	-4.34 %	-14.23 %
Public Works	3.09 %	3.85 %
Library/Senior Center	1.61 %	6.15 %
COMBINED	**-13.92 %**	**-7.58 %**



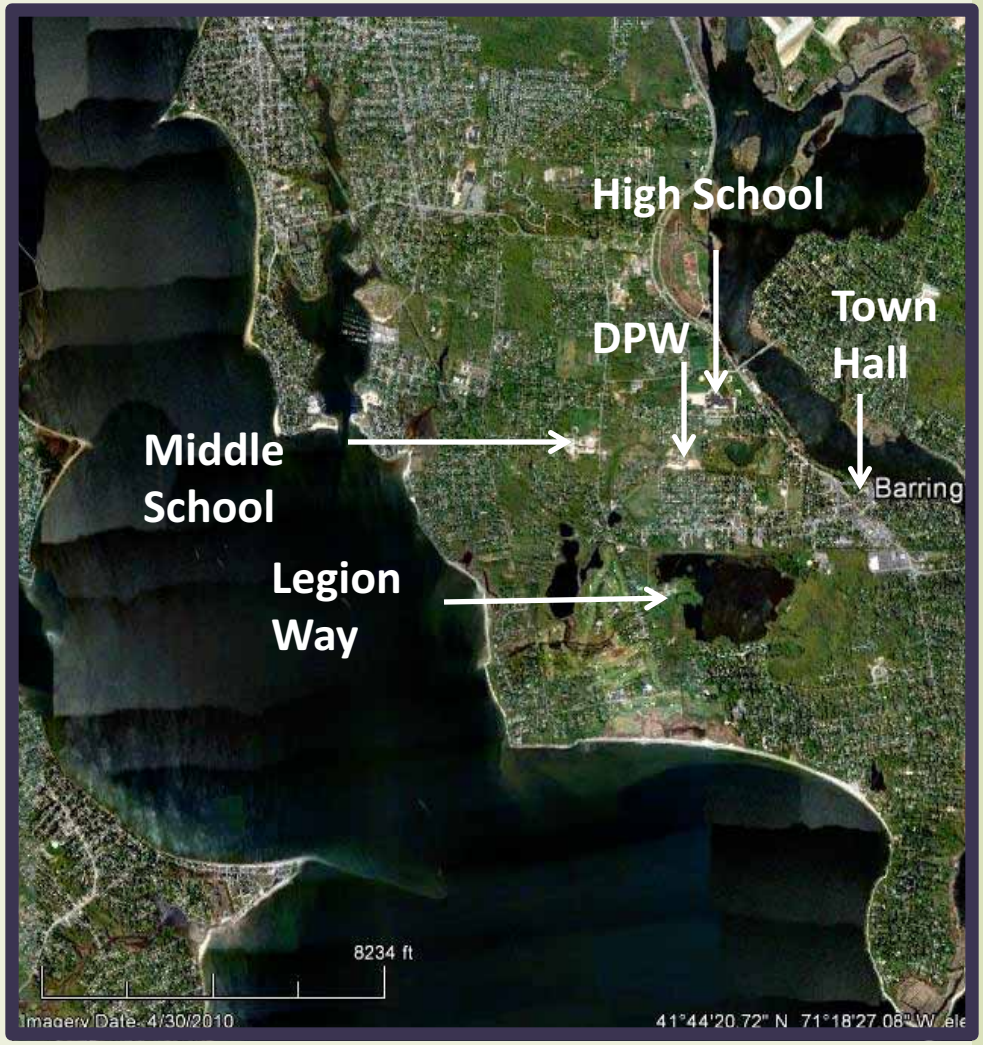
Municipal Operation Upgrades

The Wind Turbine Roller Coaster

Town Ordinances

Natural Resources/Outdoors

Wind Energy Initiative



- Wind Power Exploratory Committee formed in February 2007
- Identifies 5 possible sites for wind turbine
- Forms permanent Committee for Renewable Energy in Barrington (CREB) in November 2007
- Town applies for zero interest Clean Renewable Energy Bonds (IRS) – receives notice of award in December 2007

Wind Energy Initiative

Photosimulation
(Photographer: Jessica Millar, Barrington, RI)

- Existing regulations required energy generated to be used on site
- 1926 RI law prohibits towns from passing electric lines across streets
- High school is selected for project - largest consumer of electricity
- Funding approved by voters at May 2008 financial town meeting

Public Reaction

- Citizen's Wind Watch formed; web-site

CITIZENS WIND WATCH

GROWING GROUP OF CONCERNED CITIZEN'S OF BARRINGTON, RI. ALTHOUGH WE ARE IN FAVOR OF RENEWABLE ENERGY, WE ARE OPPOSED TO THE SITING OF A WIND TURBINE IN THE TOWN OF BARRINGTON FOR REASONS OF HEALTH, SAFETY AND LACK OF ECONOMIC AND FINANCIAL DATA.

- Cited violation of zoning ordinances
  - not permitted under open-space active zoning
  - height restriction
  - School within fall zone of turbine
- Town exempt from complying with zoning ordinances

Then a Regulatory Change…

Photosimulation over Brickyard Pond, 1,420 feet from turbine site
Photographer: Jessica Millar, Barrington, RI

- In June 2008, H7809 allowed net metering for municipalities that generate renewable energy – not tethered to receiving location.
- Proposed location changed to Legion Way location (a.k.a. Brickyard Pond/ Veteran's Park)

It Starts to Get Contentious…..

- Objections go “live” on You Tube video from Citizen Wind Watch, “Throw Caution to the Wind”
- Lawyers get involved
- ProJo calls objections “pseudo-science rigged to mask selfish aesthetic objections and a sense of privilege “ (July 27, 2008)

Response to Public Concerns

Photography: Jamie Schwartz, Barrington

- CREB issues Health and Safety Report in August 2008, addressing
  - Structural failure
  - Noise
  - Icing
  - Shadow flicker and lighting effects
  - Wildlife impacts
- In October 2008, CREB recommends a 400 kW Wind Turbine Generator at Legion Way

…and Its Demise

Effect of Tropical Storm Irene in Barrington
August 2011

- Wind study ordered by Town in December 2008
- AWS Truewind modeled winds speeds and expected energy generation using MesoMap system
- Mean wind speed at 65 m was estimated at 5.33 m/s; down from a previous estimate of 6.0 m/s
- Project no longer financially viable and Town Council voted not to proceed with the project on January 5, 2009

Municipal Operation Upgrades

The Wind Turbine Roller Coaster

Town Ordinances

Natural Resources/Outdoors

Revision to Land Development and Subdivision Regulations

Development Plan Standards for commercial/ industrial sites (§200-86):

Development must provide for attenuation of “runoff pollutants” and for groundwater recharge within Barrington Aquifer or recharge area.

Revision to Zoning Code

§ 185-13.1. Accessory Uses and Structures Allowed by Special Use Permit.

Allows small-scale wind energy systems, free-standing or attached to the building, not to exceed the 35-foot height limit for principal structures

Revision to Zoning Code

§185-210. Residence-40-Conservation Development Zoning District (R-40CD)

- Set aside 35% of the site as contiguous open space
- Up to 10% may be paved or used for recreational/cultural facilities

- Surface stormwater management systems do not qualify towards the minimum open space requirement
- Lowered dimensional requirements to encourage “cluster” type housing
- Density bonuses for additional open space set-asides

Chicken Ordinance

- **Ordinance No. 2011-2, Amending Chapter 67 of the Town of Barrington Code.**
- Allows up to 6 chicken hens per residential dwelling
- Predominantly for egg production and hen raising
- Requirements for outdoor chicken housing and fenced enclosure, cleanliness, and animal health

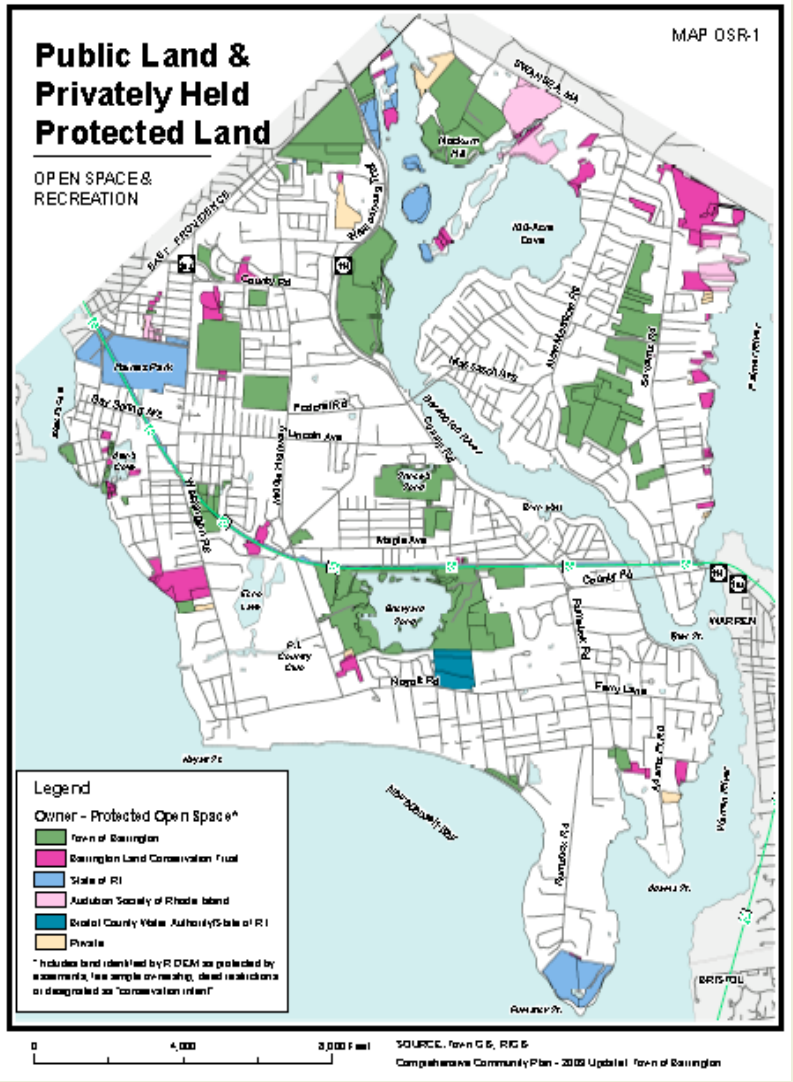
Municipal Operation Upgrades

The Wind Turbine Roller Coaster

Town Ordinances

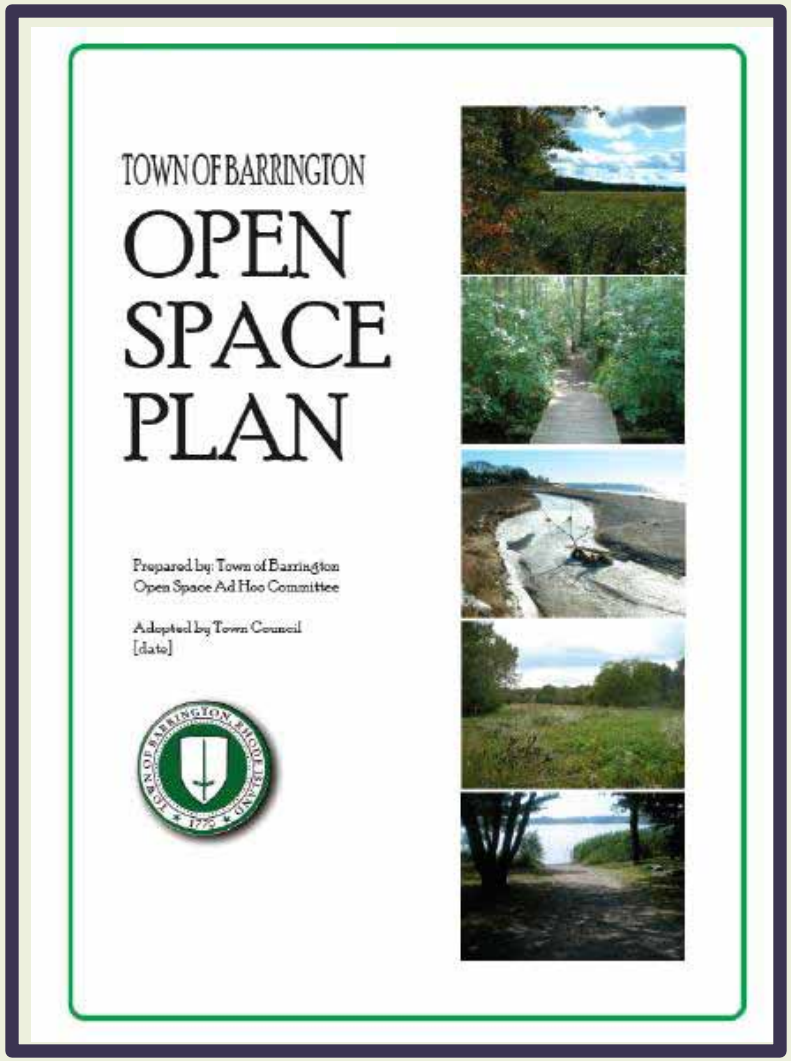
Natural Resources/Outdoors

Barrington Has Much Conservation Land



- Natural Conservation Areas 100 acres (Town/State)
- Natural Areas with Trails 343 acres (Town/State/Unk)
- Privately-owned Conservation Areas - 173 acres (BLCT/ Audubon/BCWA)
- Privately-owned Unprotected Open Space (448 acres)
- Additional Smaller Conservation Easements, etc.

Strong Commitment to Conservation



Veterans Park/Brickyard Pond Enhancement

VP Trail Improvement Project

Working with the National Park Service (John Monroe), Town Personnel (Phil Hervey, Town Planner), and volunteers.

VP Trail Improvement Project

Establishing, reestablishing, or closing walking trails

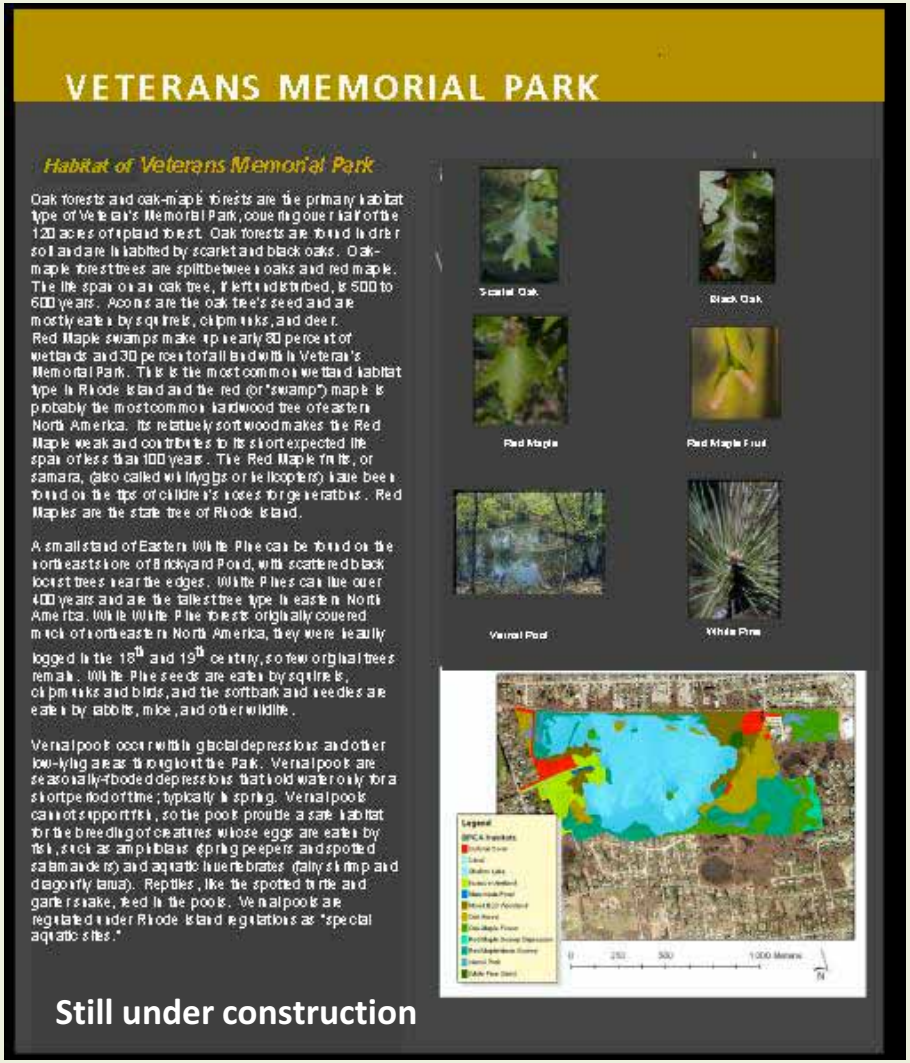
VP Trail Improvement Project

Installed trail signage

Relocated bridges

VP Trail Improvement Project

Installing educational kiosks (interpretive signage)



Landfills To Sports Fields

From this….

Landfills To Sports Fields

…to this!

Hopes for Buffer Area, From This…

To This?!

That’s all. Go Forth and Conserve.