

# Wellesley Public Schools – Massachusetts

Wellesley Public Schools serve more than 5,000 students at one pre-K school, seven elementary schools, one middle school, and one high school. The WPS system recognizes the importance of reducing its environmental impact and has collaborated with many town departments, students, faculty, parents and local non-profits to do so.

Student involvement, inter-school collaboration and sustainable planning are the driving force to reduce greenhouse gases. With Wellesley's collaboration and action, schools are working to reduce their carbon footprint in a variety of ways. Looking forward, Wellesley is aiming to further reduce single occupancy transportation to and from the schools, building net zero energy buildings, and finding creative waste management practices. All of the environmentally friendly systems and projects complement and enhance the district's mission of developing the heads, hearts, and hands of its students and inspiring them to be the critical thinkers, problem-solvers, artists and innovators who make contributions to their communities, our nation, and the world.

## **Pillar 1: Reduced Environmental Impact and Costs**

### **Pillar 1, Element 1A: Improved energy conservation/energy-efficient building(s).**

Wellesley's adoption of the Stretch Energy Codes in 2011, its fuel-efficient vehicle policy, its goal to reduce greenhouse gas emissions 25% below 2007 levels by the year 2020, and its 2017 Green Community designation by the Massachusetts Department of Energy Resources as a Green Community, all motivate and support Wellesley Public Schools' (WPS) efforts to conserve and reduce energy. The Town's Energy Reduction Plan details completed and planned energy conservation measure projects between 2015 and 2020, and the energy savings associated with each. There are a variety of other efforts in the district that reduce or improve energy efficiency, eliminate greenhouse gas, and work toward sustainable building systems.

Wellesley's greenhouse gas emissions (in metric tons of carbon dioxide equivalents) from municipal buildings (a large fraction of these are schools) is 2.1% of the total 2017 emissions (7,481) which is -19% change from 2007. More specifics are below:

15% of the Town of Wellesley's energy comes from renewable sources, and grassroots groups are working to increase that percentage.

Energy Conservation Measures (ECMs) – From FY14 to FY18, Wellesley's Facilities Management Department (FMD) installed \$1,445,000 of recommissioning, building controls (Metasys), and LED ECM projects. They are just now kicking-off another \$712,000 of LED projects in five buildings and \$265,000 of recommissioning projects in seven buildings. Overall, the plan is to complete the installation of \$6,551,000 of cost-effective ECMs (\$704,000 recommissioning + \$449,000 Metasys + \$5,398,000 LEDs = \$6,551,000 Total) by the end of FY21. They have prioritized the completion of the ECMs based on their simple payback and life cycle cost analysis. That is, the 1-3 year simple payback ECMs were completed first, now the 3-5 year ECMs are being completed, and next the > 5 year ECMs will be completed.

For FY18, Wellesley used 5% less energy (-2% Electricity + -6% Natural Gas = -5% Total) than predicted as compared to FY12 (base year). Since the public schools make up 75% of the Town facilities, the following are calculated savings from the full town facilities energy usage. The Schools should have used

65,666,591 kBtus of energy when normalized for HDD/CDD. However, they only used 62,379,939 kBtus. Therefore, Wellesley used 3,286,651 kBtus (5%) less energy (65,666,591 kBtus - 62,379,939 kBtus = 3,286,651 kBtus) than predicted. This translates into a \$49,620 cost-avoidance for FY18. To date, Wellesley's cumulative energy use cost avoidance from FY13 to FY18 is \$432,176.

Wellesley works to reduce greenhouse gases through a variety of initiatives. Energy saving measures in schools includes utilizing MassEnergyInsight to support ongoing work to identify and improve the least energy efficient buildings; identifying energy-saving changes in occupant behavior; and launching programs aimed at encouraging such changes. Changes include maintaining indoor temperatures, decreasing the use of exterior lighting overnight, identifying computers that do not need to run all the time, and setting up automatic standby/hibernate options so that the monitor, hard disk, and the system are in standby or hibernate mode at a set time; establishing guidelines for open-window air exchange; turning off equipment not in use during evenings and summers at school buildings. A year ago, Wellesley's School Committee endorsed the Town's Energy Reduction Plan to further help these efforts. Energy reduction efforts have allowed Wellesley to reduce natural gas energy use by 50,272 therms up to and including FY17 as compared to FY12.

The Massachusetts Department of Energy Resources designated Wellesley a Green Community in December 2017. With this designation Wellesley applied for a grant to fund municipal energy conservation projects. The first Green Communities grant was used to fund an energy audit of the Town's water and wastewater systems.

Wellesley had participated in Energy Star's Portfolio Manager program, however it is now trending and benchmarking its own energy use indices (EUIs).

Wellesley Public Schools are investigating the feasibility of Net Zero Energy (NZE) buildings for the 2 upcoming elementary school projects. Teams are looking to better understand the concept, installation, operation, maintenance, and especially life-cycle payback of NZE buildings. In addition, a member from the Town's Sustainable Energy Committee provided input on the High School Stadium/Hunnewell Field Project RFP, information on the sustainability of modular buildings, and feedback on proposals received.

The CHPs rated Wellesley High School has a solar array and a geothermal system. Together, these systems provide approximately 3% of the energy used at WHS.

The Wellesley Public Schools are reducing greenhouse gas emissions associated with food waste by implementing food waste diversion and food rescue program. Details of this award-winning program are described below, in 3. Pillar 1, Element 1C.

WPS students also actively focus on energy conservation. High school students "green certify" elementary school classrooms. This is a way for older students to inspire, empower and educate younger students on ways to reduce their environmental footprint.

### **Pillar 1, Element 1B: Improved water quality, efficiency, and conservation**

Quality/Efficiency - In the year 2017, 67% of Wellesley's water came from local well supplies and 33% came from the Massachusetts Water Resources Authority (MWRA). A very small portion, less than half a percent, of total water use is received from Natick to supply the area on the western shore of Morses

Pond. The availability of both local and regional water supply sources provides diversity and reliability. This is the water the schools are receiving. It comes from the 6 town wells and then goes to a treatment facility. Each year there are over 1,600 chemical/biological analyses performed by independent laboratories on the town water.

In an ongoing commitment to Wellesley improvements were made in 2017:

- The filter media of the 9 feet diameter filters at the Longfellow WTP was replaced to restore the filters to their original filtering capacity.
- The Wellesley Avenue gravel pack wells were cleaned by acid treatment and one well was provide additional treatment by Aqua Freed treatment to provide a more effective restoration of the well. The well pumps were cleaned, inspected and reinserted and one well pump and motor failed inspection and was replaced.
- The Wellesley Avenue TFC well screen and well casing failed and the 24-inch diameter well was rescreened with an 18 inch well screen and brought back into service.
- The chlorine room at the Wellesley Avenue WTP was refurbished and new chemical feed pumps were installed.
- The MWRA 48-inch transmission water main that supplies Wellesley and Needham was taken off line for repair of leaks. An above ground 24-inch bypass main was installed to provide temporary water to meet system demand until the transmission main was repaired and put back into service.
- The entrances to the Maugus reservoirs were modified with concrete slabs, risers and aluminum hatches to bring them into compliance with DEP regulations.
- A contract was awarded to a consultant to investigate ways to increase yield from the Rosemary/Longfellow well field.

Federal lead sampling occurs where needed, as well as 6,000 chemical analyses to insure proper operation of our treatment facilities. There were over 1,300 chemical analyses performed by independent laboratories on Wellesley water during the year 2016. In addition, Wellesley's own staff performed more than 6,900 chemical analyses to insure the proper operation of its treatment facilities. The categories of contaminants analyzed are: Microbiological, Lead and Copper, Other Inorganics, Volatile Organics, Disinfection By-Products, Radionuclides, and Unregulated Synthetic Organics. No violations were detected.

Wellesley does not apply any fertilizer to school lawns, which keeps both surface runoff and groundwater cleaner.

Conservation -- Wellesley Facilities Management Department (FMD) is continually optimizing processes and looking for ways for the schools to conserve the use of water.

Elementary students learn about water conservation during the Green Classroom Certification.

### **Pillar 1, Element 1C: Reduced waste production and improved recycling and composting programs**

Wellesley has taken on waste reduction efforts in a few different ways.

Food Waste -- One unique way Wellesley Public Schools has reduced waste and lowered greenhouse gases is by its food waste diversion project previously mentioned.

The Bates School was the first in New England to participate in the EPA's Food Recovery Challenge. After assessment, goal setting and project implementation, the resulting recycling and food waste diversion project resulted in a 40% reduction of the school's cafeteria waste.

Now, the program has been expanded to two more elementary schools (which have physical cafeterias) where they are implementing share tables -- aiming to eliminate food waste and provide food to those in need.

In addition, all of the WPS cafeterias across the district are now collaborating with area colleges as part of a Food Rescue Network that donates, unused, cooked food to Food For Free, a Cambridge-based non-profit. Food For Free distributes single-serve meals to people who are food insecure, including students at MassBay Community College in Wellesley. Wellesley conducts outreach to share its best cafeteria practices with other school districts. A recent Food Waste and Rescue Workshop in Wellesley attracted 40 representatives from 70 schools in neighboring towns.

EPA New England awarded a 2018 Environmental Merit Award to Wellesley's 3R Working Group and its partners for a food rescue initiative that takes edible, surplus and leftover food generated at schools, colleges and universities and passes it on to people in need. The collaborative program will donate an estimated 20,000 meals in its first year. Wellesley Public Schools led this initiative with Babson College, Bentley University, Olin College of Engineering and Wellesley College. The food service providers in these institutions were key to making this initiative so successful.

Waste/Recycling - Three major waste reduction and recycling efforts in and around the cafeterias at the schools this year include:

- WPS switched from plastic straws to biodegradable straws that are available upon request.
- Reusable "clamshells" are being used for cold lunches instead of plastic containers in a few schools
- 700 lbs of food scraps from the Wellesley Middle School kitchen go to the Town Recycling and Disposal Facility as part of the pilot food compost to bio-gas program now offered in Wellesley.

Similarly, Wellesley Green Schools is working to integrate sustainable practices into the planning of all Parent Teacher Organization (PTO)-sponsored events. The goal is for sustainable practices to be a consideration during the planning of school events. These are mostly waste reduction efforts such as the "Banquet in a Box" program. Here, the Wellesley school community can borrow table cloths and large water containers for use at various school-sponsored and team events that get re-used. Wellesley Green Schools also catalogued decorations/event supplies and other items that can be reused at events across the district.

For many major school events, Wellesley Green Schools encourages PTOs to utilize the free water drinking station provided by Massachusetts Water Resources Authority (MWRA) to further reduce plastic bottle waste.

An end of year "green" locker clean-out is planned for the middle school and some elementary schools. Teachers and parents organize the clean outs so that students can easily donate items to nonprofits in need of school supplies and clothing.

On the administration side, more than 8 tons of cardboard was removed from the school waste stream last year.

### **Pillar 1, Element 1D: Use of alternative transportation to, during, and from school**

WPS has been investigating ways to reduce single occupancy vehicles and increase alternative transportation methods. Based on a report that was done with Wellesley, Babson and Olin College students, the WPS has added an additional morning high school bus. The Wellesley Board of Selectmen and the Wellesley School Committee approved a Fuel Efficient Vehicle Policy (FEVP). The FEVP requires that when the municipality replaces vehicles subject to the policy, the municipality purchases efficient models, where these models are commercially available and practicable.

In addition, students, and parents have worked on no idling campaigns at pick-up lines across the district. Walk pools, carpools, bike racks and walk to school days are other means of alternative transportation happening in the district. Wellesley Green Schools has used resources through MA's Safe Routes to School to encourage more safe biking and walking to school.

## **Pillar 2: Improved Health and Wellness**

### **Pillar 2, Element 2A: An integrated school environmental health program**

Environmental health and safety and indoor air quality are the highest priorities for Wellesley's Facility Management Department, who provide custodial and maintenance support for all schools in the district. They realize it provides the best possible learning environment and achieve this by integrating best practices used by its custodial and maintenance staff.

Wellesley uses an ionized water system (Orbio os3) to clean the schools. This state-of-the-art system uses plain tap water for most cleaning applications. Not only is this a low carbon footprint system, it eliminates harsh chemicals and associated off-gassing which can affect students and staff. "Team-cleaning" approaches are used by custodial staff in the High and Middle schools to improve efficiency, and vacuums with HEPA filters, strategically placed walk-off mats and "auto scrubbing" machines that eliminate "mops and buckets" are used throughout the District. Sustainable third-party certified products, including paper products and trash can liners, are also used in all schools.

Indoor air quality (IAQ) in all school buildings is monitored by a building management systems (Metasys) which provides for remote supervision of all heating, ventilation and air-conditioning systems, thereby allowing immediate response to correct problems that may affect student comfort, including ventilation, temperature and humidity. The District is committed to providing appropriate IAQ on a long-term basis by its capital projects which include comprehensive HVAC "Recommissioning" projects at all schools on a regular 5 to 7-year cycle. Day-to-day operation of the HVAC systems is provided by custodial staff reviewing the Metasys programs for each building throughout the day, and preventive maintenance of

the equipment and systems is executed using PM Direct, a cloud-based, computerized maintenance management systems (CMMS).

Integrated Pest Management (IPM) includes both indoor and outdoor plans posted on the State's Department of Agricultural Resources website and monthly inspections performed by certified IPM technicians, which includes interviews with custodial and school staff regarding any pest activity. Products and practices used to address pest issues are safe to students and staff. Reports are completed on site and included in a log book and also posted to a website. IPM is just one example of the environmental issues monitored in our schools. A project manager is responsible for ensuring compliance with the following areas, which is documented and tracked in comprehensive binders for each school:

- Chemical Storage Guidelines
- Universal Waste Management
- Acid Neutralization System
- Solvent Disposal Procedures
- Art Department Photo Chemicals
- Obsolete Hazmat Disposal Procedures
- Uniform Waste Manifests
- DEP Source Registration
- Emergency Generator
- Nurses Medical Disposal
- Blood-borne Pathogen Procedures
- IPM Plans

Gas leaks are a statewide health and safety issue. Wellesley Green Schools is working with the School Committee and the Natural Resources Commission to urge National Grid to fix gas leaks, especially leaks in close proximity to the schools.

## **Pillar 2, Element 2B: High standards of nutrition, fitness, and outdoor time**

Nutrition -- The WPS Food Service Team is very mindful of the footprint that the food served to the students and staff has, and thus buys many products local including rainbow chard, tomatoes, sweet potatoes, cauliflower, apples, squash, carrots, cheeses, butter, yogurt, eggs and milk. They also offer meatless Mondays. They have partnered with students in an 8th grade class to serve the salad that the students grew in the hydroponic greenhouse garden. A Tufts PhD graduate is working with Wellesley Food Services to identify ways the school menu can assist further lowering its carbon footprint.

Fitness -- As resources allow, at least one elementary school provides BOKs, a physical activity program, in the mornings before the start of school. In addition, a new program has started. This local, parent-run, nonprofit provides inclusive, fun, physical activities for after school including yoga, flag football, basketball, dodgeball, spike ball, corn hole and more for middle and high school students.

Outdoor time -- More than half of the schools in the district have gardens, some have landscaping and outdoors clubs, offering alternative, additional and unique healthy, outdoor time. Outdoor club activities include hikes on local trails and visits to local organic farms.

### **Pillar 3 – Environmental and Sustainability Education**

#### **Pillar 3, Element 3A: Interdisciplinary learning about the key relationships between dynamic environmental, energy, and human systems**

Wellesley's educators have added new, thoughtful science curriculum across the district. Curriculum is based on MA standards but the curricula now reflects more environmental awareness. This allows students to be able to engage in dialogue about current events, and have respect for, and understanding the dynamic environmental, energy, and human systems.

Pre-K launches the environmentalist with curriculum topics such as 'made by humans vs found in nature'. K-5 has new units specifically related to environmental awareness including Kindergarteners exploring ways human have an impact on the environment (particularly by producing trash, air and water pollution) and some effects can be minimized by reducing, reusing, and recycling. Second Grade students investigating natural and human-made solutions to problems of erosion. Fourth Grade students research nonrenewable and renewable energy sources. Fifth Grade students study the availability of freshwater on earth; design water filters to clean polluted water; and consider how to reduce human impact on the environment by changing agricultural, industrial, or community practices.

The Middle School Science Department continues to improve and refine their curriculum, including topics such as climate change, weather, energy, as well as the engineering elective (hydroponic gardening). Another AP Environmental Science course is now offered at the high school. Amongst an intriguing curriculum, the students partner with the local recycling and disposal center.

#### **Pillar 3, Element 3B: Use of the environment and sustainability to develop STEM content, knowledge, and thinking skills**

Every other year Wellesley hosts a STEM Expo; a hands-on science, technology, engineering and math (STEM) exposition. Many of the speakers, hands-on exhibits, workshops and student work showcased highlight environmental responsibility including the town-wide Sustainability Challenge which is open to K-12 students. This event allows students to develop new STEAM knowledge and challenge themselves in new ways to think and act on environmental sustainability.

Beyond the teacher's influential, hands-on, student-centered, engaging, relevant, inquiry-based STEAM curriculum, students are taking the initiative on many environmental sustainability issues. For example, the High School Evolutions program (an innovative school-within-a-school educational program open to juniors and seniors, with three tenets distinguishing it from a typical classroom structure: collaboration, interdisciplinary learning, and experiential learning) allows students to work year-long on sustainable themed projects including: investigating solar installation, aquaponics, tree canopy, renewable energy and plastic water bottle reduction projects.

There are also numerous opportunities for students to use their STEAM knowledge and skills. This is especially seen in Wellesley High School's Climate Action Club, and the numerous sustainable and

environmentally related senior projects that Seniors focus on and work on as the culmination of their high school experience.

**Pillar 3, Element 3C: Development and application of civic engagement knowledge and skills**

Wellesley students take their knowledge and enthusiasm into practice. Many students take part in the walk to school days and the no idling initiatives. They do projects showing their desire to make environmental impacts. Many times Wellesley High School students are seen at public town meetings offering their views on ways Wellesley can build more sustainably, encouraging town boards to use more renewable energy sources, advocating for new school buildings to be net zero and more. Others have written to local and state representatives on sustainability related issues.

## Highlights – Wellesley Public Schools; Wellesley, MA

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